January 19, 1956

The IRON AGE

The National Metalworking Weekly

Plant Dispersal: Where's The Incentive?

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What Will Autos Be Like In '65?

P. 44

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Tips on buying a stamping press ... 67
Are your phone costs out of hand? ... 31
How Czechs front for Red industry ... 35

Digest of the Week—Page 2

7 of the 8 open hearths in No. 2 shop at Indiana Harbor have Ramset bottoms

YOUNGSTOWN Sheet and Tube is making steel on 7 Ramset bottoms in its No. 2 open hearth shop at the Indiana Harbor Works.

The majority of bottoms installed in new open hearth shops during the past several years are of rammed construction. And of these hearths, Ramset installations number more than half again as many as any other magnesia ramming mix.

Basic Refractories pioneered the development of rammed hearth techniques several years before World War II. These methods have been continuously refined by the practical steelmakers who form the sales and service staff of Basic Refractories. As a result Ramset and Basic's installation techniques have become accepted as standard throughout the industry.

When deciding upon Ramset steelmakers select a proven refractory and proven installation methods, thus insuring the most dependable open hearth bottom construction available.

BASIC REFRACTORIES INCORPORATED 845 HANNA BUILDING, CLEVELAND 15, OHIO

REFRACTORIES ENGINEERING AND SUPPLIES, LTD. — EXCLUSIVE CANADIAN AGENTS

Architect: Ellerbe and Co.; *General Contractor:* Wm. Baumeister Construction Co.; *Fabricator:* St. Paul Structural Steel Co.; *Erector:* N. H. Sandberg Erection Co. — all of St. Paul.

THEY USED BOLTED JOINTS FOR NEW BUILDING IN ST. PAUL

This block-long structure, completed recently at Victory Square in the Loop, St. Paul, is the head office building of Minnesota Mutual Life Insurance Company. The 8-story Kasota stone building has a steel framework of 1,122 tons. The structural members are joined by approximately 22,000 Bethlehem High-Strength Bolts.

Bethlehem High-Strength Bolts are ideal for joining structural members because of the saving they make possible in erection time. They are quickly installed by means of a calibrated pneumatic impact wrench, which applies sufficient torque to provide permanently tight joints. Besides, the wrench is far less noisy than a riveting gun, making high-strength bolting particularly desirable for construction near hospitals and schools, and in other areas where noise is especially objectionable.

Bethlehem High-Strength Bolts are made of carbon steel, are heat-treated by quenching and tempering, and meet the requirements of ASTM Specification A-325.

Why not let one of our engineers explain in detail the advantages of using Bethlehem High-Strength Bolts? A call to the nearest Bethlehem sales office will bring him to your desk promptly. Or write direct to us at Bethlehem, Pa.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

January 19, 1956—Vol. 177, No. 3

The IRON AGE

DIGEST OF THE WEEK

Starred items are digested at right.

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NEWS DEVELOPMENTS

BARGE BOOM MARKS MOVE TO WATERFRONT P. 30

Barge traffic has tripled since 1946. Over 700 vessels came out of inland shipyards last year as power companies, aluminum and chemical industries stepped up their move to waterfront sites. Plentiful water supplies, low shipping costs are big reasons for industrial activity.

COMMUNICATION PLANS CUT COMPANY COSTS P. 31

A New England metalworking firm reports $85,000 saved through better communications. Similar savings are being realized by other companies as they give more thought to phone, wire and mail service.

CENT SHORTAGE PUZZLES MINT OFFICIALS P. 36

The current squeeze on currency coppers is puzzling U. S. Mint and bank officials alike. Best guess, they say, is that thousands of piggy banks, meters, vending machines, plus local taxes are taking biggest bites out of the 20 billion 1¢ coins.

NOT ONE, BUT TWO TYPICAL 1965 CARS P. 44

Decentralized living trend means specialized functions. Electric car for shopping, big car for highway. Gas turbine has inside track for car of future, but reciprocating engine is not out of it. Free piston engine isn't looked on favorably in Detroit.

GOVERNMENT PLANS ANOTHER SPENDING HIKE P. 49

U. S. outlays, now at a rate of $64 billion a year, will go up $2 billion in fiscal 1957. Military buying, highway outlays and foreign aid will fatten the budget.

Jan. 19, 1956

BOMB DAMAGE in Ruhr Valley shows vulnerability of concentrated industry, points up need for U. S. dispersal. Danger is bringing new proposals for dispersal incentives. Story-P. 27 (Wide World Photo.)

PENTAGON PUZZLES OVER WEAPONS AND TOOLS P. 55

Defense Dept. is pulling machine tools out of reserve storage, putting them to work in current production. Move may mean Pentagon has decided next war will be short and there's no point in worrying about production that will never have a chance to build up.

FEATURE ARTICLES

HOW CONTRACT STAMPERS CHOOSE PRESSES P. 67

Customers nag the job shop stamper around the clock. And they gage his value as a supplier by his speed of response to sudden demands. Just what kind of equipment is needed to run a contract stamping plant efficiently? Here's how one shop operator evaluates factors involved.

GET BETTER WELDS FROM A WELDABLE STEEL P. 70

Here are some suggestions for capitalizing more fully on the good welding qualities of Carilloy, a low carbon quenched and tempered constructional alloy plate steel. Tests show that welding does not affect tensile properties, improves hardness, toughness. Of various joints, single V with 50° included land proved best. Wire of 3/32 in. diam proved most economical.

SEAL RIVETED TRAILERS AGAINST SUBMERSION P. 72

It's always possible that a trailer carrying expensive military radar equipment might have to ford a river. Certainly it will be exposed to all types of weather. To completely waterproof the trailers they build, Thompson Trailer Corp. uses a variety of sealer materials. Application is simple, and protection thorough.

NEW TRENDS EXPAND ANODIZERS' MARKET P. 74

Aluminum curtain wall construction blends well with modern architectural trends. Market climbed 500 pct over the past 5 years. New equipment in one firm is anodizing aluminum in lengths to 30 ft with precisely controlled coating thickness. Instrumentation protects quality.

DUAL SPRAY APPROACH SPEEDS COATING LINE P. 80

Combining electrostatic and manual paint spraying can often solve problems on your painting line which neither method can solve alone. Inherent benefits of electrostatic spraying can thus be realized while retaining flexibility in the line. Carefully planned, a dual spray line combines high production with substantial savings in coating costs.

MARKETS AND PRICES

METAL FASTENERS HOLD TO MARKET GAINS P. 32

Nervous metalworking segment hopes to keep market at steady rate of gain. New fasteners, marketing techniques, and reaching into new fields help assure gain in 1956.

INFRA-RED INVADES INDUSTRIAL HEATING P. 34

One company shipped 10,000 gas burning infra-red heaters last year. Most were for cooking, textile and paper drying. But other industrial applications, including the fusing of enamel to steel, are bringing still wider use of infra-red.

CZECHS WILL LEAD NEW RED TRADE DRIVE P. 39

Current Soviet planning calls for Czechoslovakia to head up new Red export-import drive. The Red bloc will use the Czech's front door as take-off point for market grab.

IS STEEL MARKET IN FOR SOME SURPRISES? P. 123

While some people wax optimistic about steel supply, the market continues tight. Further, a few surprises may be in store from construction and other sources. There's more fiction than fact in talk about automotive cutbacks as they affect steel.

LEAD PRICE DROPS UNDER LONDON PRESSURE P. 130

Keep your eye on the London market warned THE IRON AGE, January 12, for tipoff on the lead and zinc markets in this country. This week the lead market in London fell badly, followed almost immediately by a drop in the price of lead in the U. S.

NEXT WEEK:

A CLOSEUP OF IRON ORE PICTURE IN '56

Do we face an iron ore pinch in 1956? Editor-in-Chief Tom Campbell gives the lowdown as the steel industry enters one of its busiest years. What's going on in tiny Dominican Republic that will have a bearing on the outlook? Who is helping to develop Dominican high-grade lump ore?

WHY IS THE BIG MONEY BEHIND VACUUM METALS?

Whether you produce metals or fabricate them, you'll want to keep tabs on vacuum metallurgy. Are vacuum-processed alloys so much better than regular grades? Who melts these materials? Who makes the equipment? Here are answers to these and other questions to bring you up to date.

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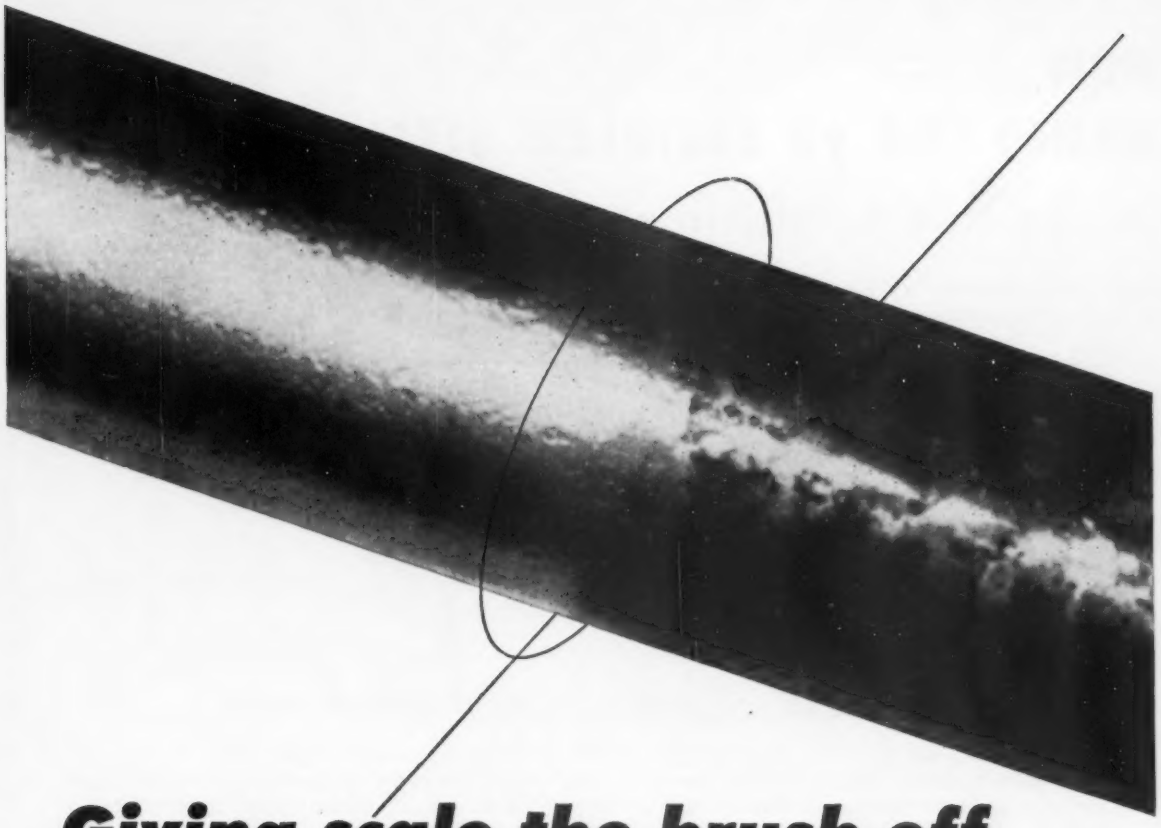
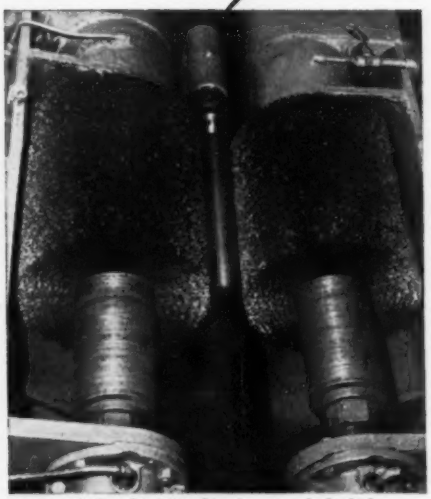


Giving scale the brush off



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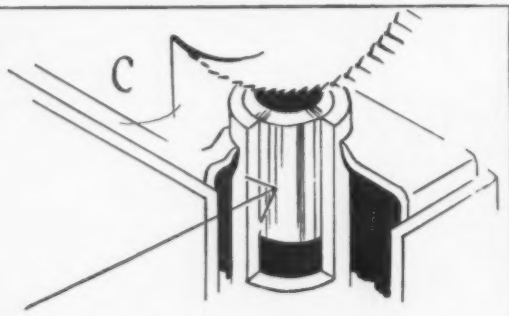
HOW ARMCO 17-7 PH STAINLESS STEEL

keeps this lighter in shape

A tiny hardened Armco 17-7 PH Stainless Steel bushing is the key to dependability and long service life of a well-known lighter.



WHAT THE STAINLESS BUSHING DOES

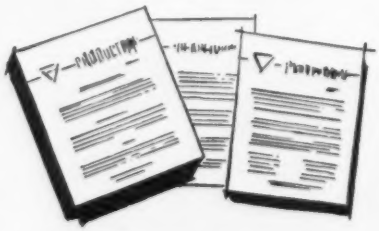
This collar in the top of the tube keeps the flint in alignment and prevents jamming. The collar must be perfectly formed and very hard. That's why it's made of Armco 17-7 PH Stainless Steel, precipitation hardened.

NO "FLOPOVER" FLINTS

In an ordinary flint tube, repeated pressure of the spark wheel against the flint causes the end of the tube to expand. This permits the flint to "flop over," making the lighter useless.

WHAT THIS STEEL OFFERS YOU

Consider the advantages of Armco 17-7 PH Stainless Steel for your products. It can be drawn and formed in the annealed condition to close tolerances. Then, it can be hardened at low temperatures to tensile strengths of around 200,000 psi. It is "transformed" by holding at 1400 F for 1½ hours and cooling to 60 F or below. Hardening is completed by heating to 950-1050 F, holding for ½ to 1½ hours and cooling.



GET COMPLETE DATA

Armco 17-7 PH is produced in sheets, strip, plates, bars and wire. Besides, there is a single heat treatment precipitation-hardening stainless steel, Armco 17-4 PH, made in bars, wire and billets only. For complete information on these special Armco Stainless Steels, just fill out the coupon and mail it to us.

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Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

EDITORIAL

Yes! This IS a Crucial Year

◆ THIS YEAR will be replete with bombast, politics, false scares, war talk and rumors. It will be another year to test (or wrack) our nerves.

The question of the year is and will be to the very end, "How long will good business last?" Unfortunately we can't wait for the final answer. We must act wisely—or unwisely—now.

Before our crystal ball gets clouded let's take a look:

Will HE run again?—Chances are that even President Eisenhower doesn't know for sure if he will run again. But there are a great many businessmen who are certain that he will. If he doesn't they will be terribly let down. The odds are against the President's running for reelection. If, unfortunately, he doesn't run, don't count on business taking a serious nosedive.

Will this be a strike-torn year?—It is more than an even chance that labor and management will lock horns more often this year. Barbs in management's side will be demands for supplemental unemployment benefit plans, big wage increases and a union shop where labor doesn't now have it. Better plan to hedge against work stoppages. If they don't come, your strike hedges will become price hedges.

What about defense spending?—It looks as if it will outrun the Administration's 1957 estimates—just as it is doing this year. The outlook in the Middle East and Far East is anything but reassuring. Russia's gain in steel output, aircraft production and design, naval additions and successful Asiatic propaganda mean a bigger defense budget for us.

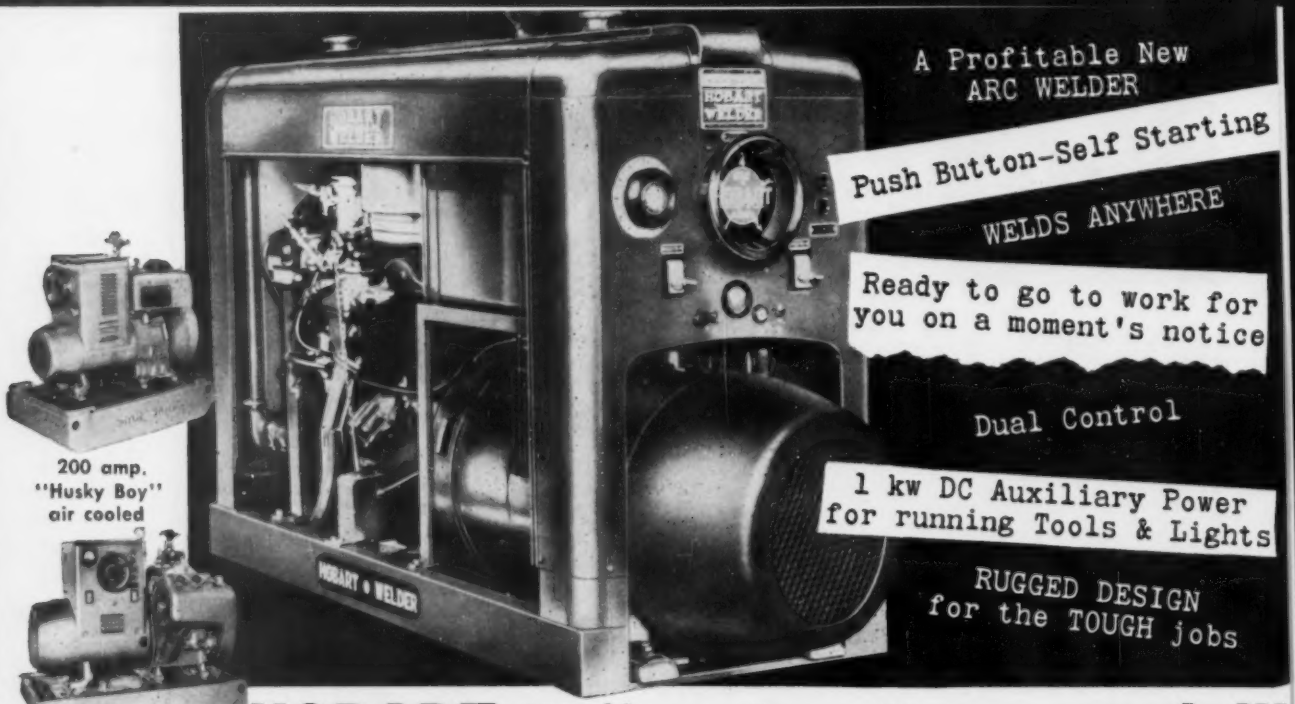
Are we depression proof?—It may be old fashioned to say so but as long as we act like human beings we will never have a depression proof economy. Lots of cushions yes, but no guarantee of Utopia.

Will a downturn come this year?—This is semantics. We are already bumping the top of the charts. There is only one way to go for a breather: downward. But we think this will be a "sideways" movement—not a signal to run for the storm cellars.

This will be a crucial year—but a good one for you.

Tom Campbell

EDITOR-IN-CHIEF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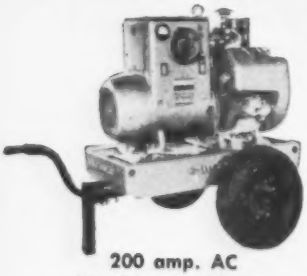
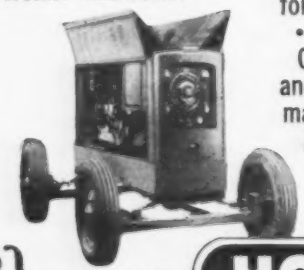


200 amp. AC Welder—AC Power



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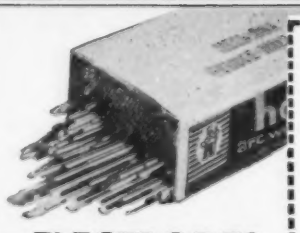

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dear editor:

letters from readers

Depreciation

Sir:

Your editorial, "We Need Realistic Depreciation" is not only timely, but if actions such as you suggest are taken by our Government it will mean as much to the Government as it does to industry.

It is not only very penalizing, but it is putting such a heavy load on industry that it cannot be continued without serious results.

Operation of a plant 24 hours a day is one thing that some authorities claim is less wearing on machinery than only an 8-hour operation. However, I would take the view that is not an honest charge to make for the reason that there is an end to what a machine can stand up under. Even on a 6-day week, 144 hours of constant operation will sooner take the life out of metal (as well as any other material that may be used) with all of our scientific knowledge used in connection therewith than a 5-day week of 120 hours. We all know what the 12-hour shift in the steel industry meant in the good old days and certainly since the 8-hour shift operation has become standard humans are useful for a longer period of years than in any other period of history.

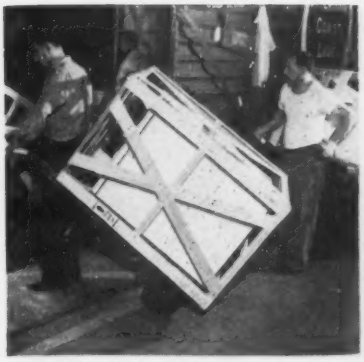
This editorial is one that belongs with those I consider your prize efforts. *S. L. Gabel, Superior Tube Co., Norristown, Pa.*

British Barb

Sir:

"Are You Wasting Manpower?" —your Oct. 27 editorial, and then I turn to p. 38 and see the photograph. After all we have learned from you on materials handling, automation and American efficiency.

Please assure me that it is a scene in Mexico, India or some



backward community so that I can enjoy and profit from future IRON AGES, as I have done from those in the past. *L. R. Evans, Sheffield 11, England.*

No comment, except to say that this certainly shows that there's still a big market in the U. S. for materials handling equipment.—Ed.

Program for Survival

Sir:

The writer was very much impressed by the editorial, "Program for Survival" in your December 22nd issue, and would very much appreciate receiving several copies of this editorial if they are available. *A. R. Draper, General Purchasing Agent, North American Cyanamid Limited, Niagara Falls, Ontario, Canada.*

Sir:

I certainly enjoyed and appreciated your editorial of December 22. We need to be reminded that there is no quick and easy panacea for our difficulties—and that what we are fighting for is worth the best efforts of all of us. I see no solution in the ranting of the radicals nor the declamation of the demagogues.

Thanks for what you have said. *W. E. Brainard, President, Arcrods Corp., Sparrows Point, Md.*

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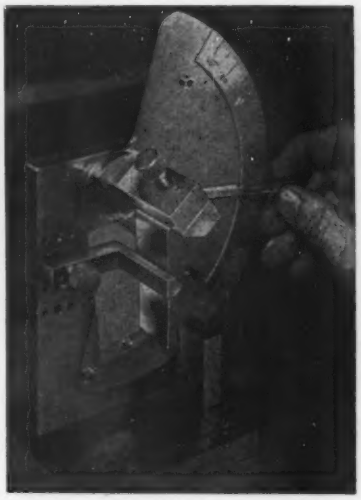
THIN STRIP

no standard is too exacting



Temper requirements for the thin nickel strip (.002″) used in sensitive electronic tubes were too exacting to be checked by the usual methods. So Somers carefully hand checks several samples from each lot by the ultra-precise "bend test" illustrated above.

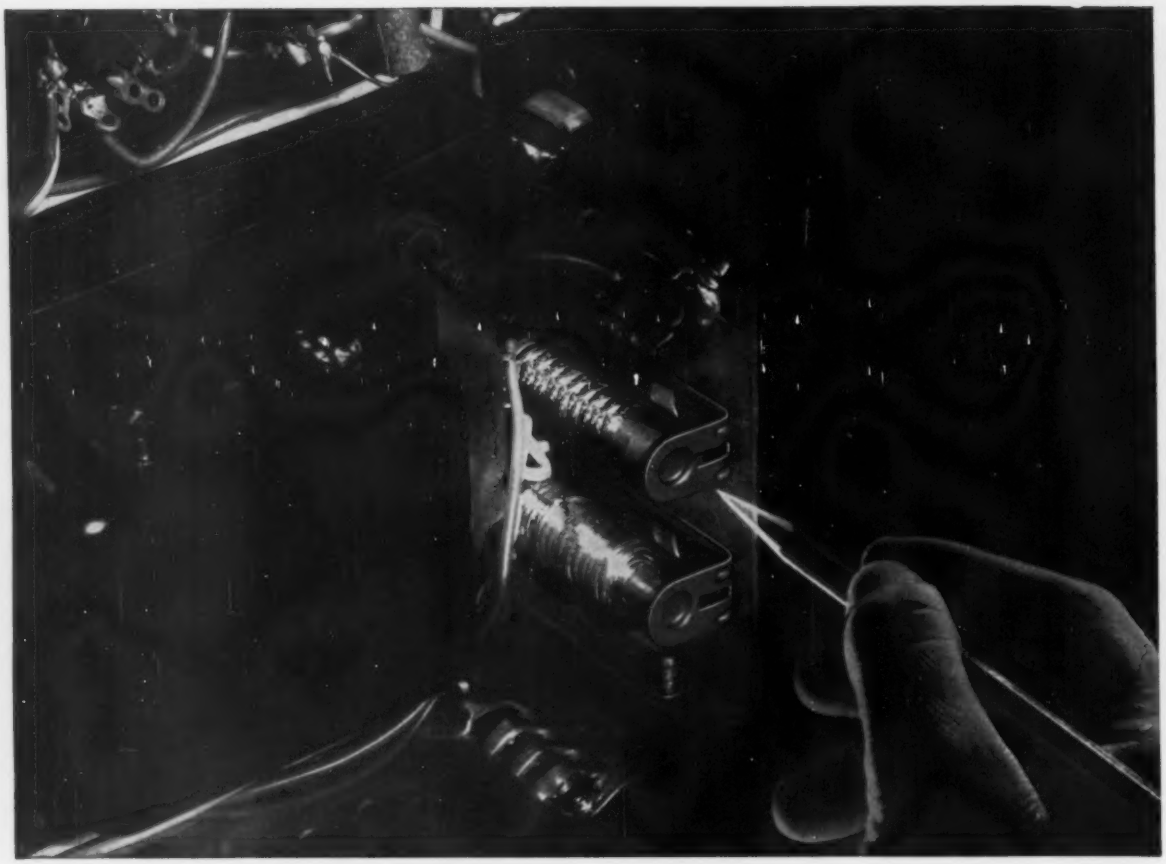
Since 1910 Somers Brass Company has specialized in producing thin strip: nickel and its alloys below .020″ and copper and its alloys below .012″ with the tensile properties, fatigue resistance, drawing properties and many other requirements which only the most exacting standards of production and quality control can meet.

Whatever your specifications may be, why not take advantage of Somers long experience? Write for field engineer or Confidential Data Blank for a complete survey of your problem at no cost or obligation.

FOR EXACTING STANDARDS ONLY

Somers

Somers Brass Company, Inc.
WATERBURY, CONN.



Engineered by Tinnerman...

SPEED CLIP® simplifies assembly, adjustment and servicing...and saves money!

The Westinghouse Television-Radio Division, Metuchen, New Jersey, needed a fastener to fill a complex fastening requirement. Tinnerman was consulted, and developed a *special* SPEED CLIP that fit the job perfectly!

This one-piece, spring steel SPEED CLIP is assembled quickly and easily to the television tuning coil. The SPEED CLIP, with tuning coil attached, is then simply snapped by hand into twin mounting holes in the chassis to lock the unit securely in place. This SPEED CLIP cuts costs on the assembly line. And it permits fast and simple adjustment of the television tuning coils, eliminating the problem of blindly searching with a screw driver for the slot of a special hex nut.

Find out how SPEED NUT Brand Fasteners can help you improve your own fastening methods. Ask your Tinnerman representative for details of our Fastening Analysis Service or write for Bulletin No. 336.

TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio
Canada: Dominion Fasteners, Ltd., Hamilton, Ontario. *Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois, (Seine). *Germany:* Hans Sickinger GmbH "MECANO", Lemgo-i-Lippe.

TINNERMAN Speed Nuts®
FASTEST THING IN FASTENINGS®

fatigue cracks

by William M. Coffey

Letters

Remember when F. H. N. Carter, Vice President of Sunrod Mfg. Corp., told us we were slipping and please pass the Alka Seltzer and asked if we were attending the January meeting of the Compressed Gas Assn. and we wrote back and said we were *president* of said Assn.? Then we get this letter:

Mister Coffey:

You sir, are an imposter and shall be so reported to T.C.C. & F.B.I.

However, you're invited to our Meeting Jan. 23 and 24 — you might get some pointers.

J. L. Lincoln, Jr.
Presently President
Compressed Gas Assn.

Just goes to show. The readership of THE IRON AGE is just simply amazing. Does this mean that Mr. Lincoln is our 24th loyal reader of Fatigue Cracks or has Mr. Carter dropped out, keeping us at the traditional 23? By the way, can Mr. Carter come, too, Mr. Lincoln?

Dear Mr. Coffey:

Here is our answer for your November 24 puzzle: 5,760 boards. (*Answer is right—Ed.*)

Due to the slow circulation of IRON AGE at Collins Radio Company (everybody must read it), our Club receives each copy late which causes us to be slow in getting our answers to you. If we should happen to miss the deadline, we hope our answers will be published in subsequent issues. (*Sure they will —Ed.*)

We enjoyed *Un, Deux, Et Trois* very much and we thought you might enjoy the enclosed clipping from the *Cedar Rapids Gazette.*

Iron Age Puzzle Club
John E. Homer, Jr.
Norman Chase
Dave Gromman
Jack McCallum

. . . and here's the clipping:

A Hollywood western has been dubbed with a German sound track for screening through West Germany.

In one of the sequences an Indian chief raises his hand and is made to say: "Wie Gehts."

Which recalls a 1950 French-captioned western in which the villain pounded on the frontier bar and roared: "Gimme a shot of Red Eye."

The discreet French subtitle read: "Dubonnet, s'il vous plait."

Puzzlers

About time we started catching up with this. Seems there are two answers (one for the A&P and one for P&G) to the puzzler of Dec. 15 about how to divide $1.00 into 50 coins. First answer: 40 pennies, 8 nickels, 2 dimes. Second (and equally as good), 45 pennies, 1 quarter, 2 dimes and 2 nickels.

We interrupt this program due to reasons that are pretty good . . .

WHAT DO YOU THINK OF THE NEW COVER?

You must have noticed! 27 of the best illustrators in America took a crack at reworking our front cover and those boys don't work for fame. But tell us what you think. Every week from now on the Editorial Dept. will come up with a new one—catchy, timely, intriguing. With a glance you can now tell what's hot in the "book" this week. Frame them for your den.

. . . and the winners: Nels Johnson, Marilyn Erwin, K. W. Kaveler, Bob Millett, ole Jim Mull, Robert P. Culp, Jim Carlin, Jr., J. Denney Smith, Sarah Wisnasky, Robert Lupac, George Frederick, Bill Post and the Collins Radio Iron Age Puzzle Club.

Tempilstik°

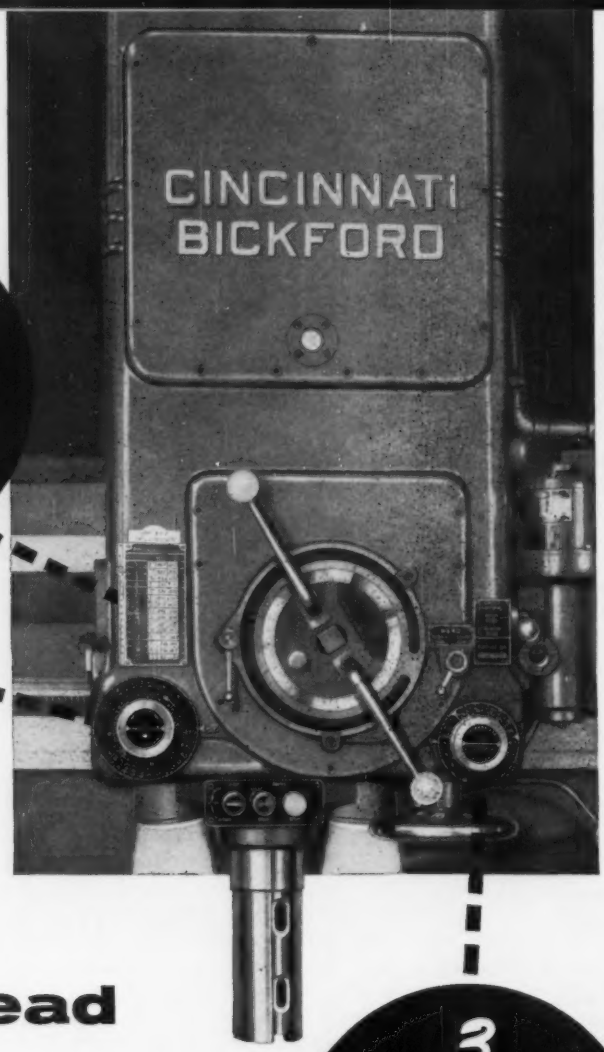
FOR ALL HEAT-DEPENDENT OPERATIONS

looks like a crayon...
marks like a crayon...
tells temperatures like a precision instrument!

Sixty-three different compositions enable you to determine and control working temperatures from 113° to 2000° F. TEMPILSTIK° marks on workpiece "say when" by melting at stated temperatures—plus or minus 1%.

ALSO AVAILABLE IN LIQUID AND PELLET FORM . . . WRITE CUSTOMER SERVICE DEPT. FOR SAMPLE TEMPIL° PELLETS . . . STATE TEMPERATURES OF INTEREST—PLEASE!

Tempil°
CORPORATION
132 WEST 22ND STREET
NEW YORK 11, N. Y.



1.

The Prescheduling Chart plans the sequence of operations . . . charts the proper speeds and feeds . . . is a permanent record of each tool diameter, speed and feed.

2.

Speed Dial — Preselects any one of 36 speeds while machine is in operation—shift is automatic at end of each operation.

The HEAD that's way ahead

. . . brings you 3 outstanding performance features!

3.

Feed Dial—Preselects any one of 18 feeds for next tool while machine is in operation — shifting is quiet and direct.

The concentration of complete control of all speeds and feeds by two easily read dials on the head is an outstanding advance in design.

Saves time — insures controlled correct operation — and is easy for the operator.

Hydraulic shift for speeds and feeds is quiet and positive. All mechanism for preselection is contained in the head. These ultra modern Super Service Radials have many other advanced features — for easy handling and high productivity.

Write for Bulletin R-33. You will be interested in the many new features.

CINCINNATI
BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Subsidiary of GIDDINGS & LEWIS MACHINE TOOL CO. : Fond Du Lac, Wisconsin.

Cincinnati 9, Ohio, U.S.A.

dates to remember

JANUARY

MALLEABLE FOUNDER'S SOCIETY—Semi-annual meeting, Jan. 20, Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

COMPRESSED GAS ASSN., INC.—Annual meeting, Jan. 23-24, The Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

INDUSTRIAL HEATING EQUIPMENT ASSN., INC.—Annual meeting, Jan. 23-24, LaSalle Hotel, Chicago. Assn. headquarters, 155 E. 44th St., New York.

EXPOSITIONS
1956

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

TRUCK - TRAILER MANUFACTURERS ASSN.—15th annual convention, Jan. 23-25, Edgewater Gulf Hotel, Edgewater Park, Miss. Assn headquarters, 1042 National Press Bldg., Washington, D. C.

PLANT MAINTENANCE & ENGINEERING SHOW—7th annual conference, Jan. 23-26, Convention Hall, Philadelphia. Society headquarters, Clapp & Polick, Inc., 341 Madison Ave., New York.

NATIONAL RURAL ELECTRICAL COOPERATIVE ASSN. — 14th annual meeting, Jan. 23-26, St. Louis, Mo. Assn. headquarters, 155 E. 44th St., New York City.

AMERICAN STANDARDS ASSN.—Gaillard Seminar on industrial standardization, Jan. 23-27, New York City. Assn. headquarters, 70 E. 45th St., New York.

AMERICAN MANAGEMENT ASSOCIATION — General management conference, Jan. 24-27, Fairmont Hotel, San Francisco. Society headquarters, 1515 Broadway, New York 36, N. Y.

ENGINEERS JOINT COUNCIL—Second annual general assembly, Jan. 26-27, Hotel Statler, New York City. Society headquarters, 29 W. 39th St., New York.

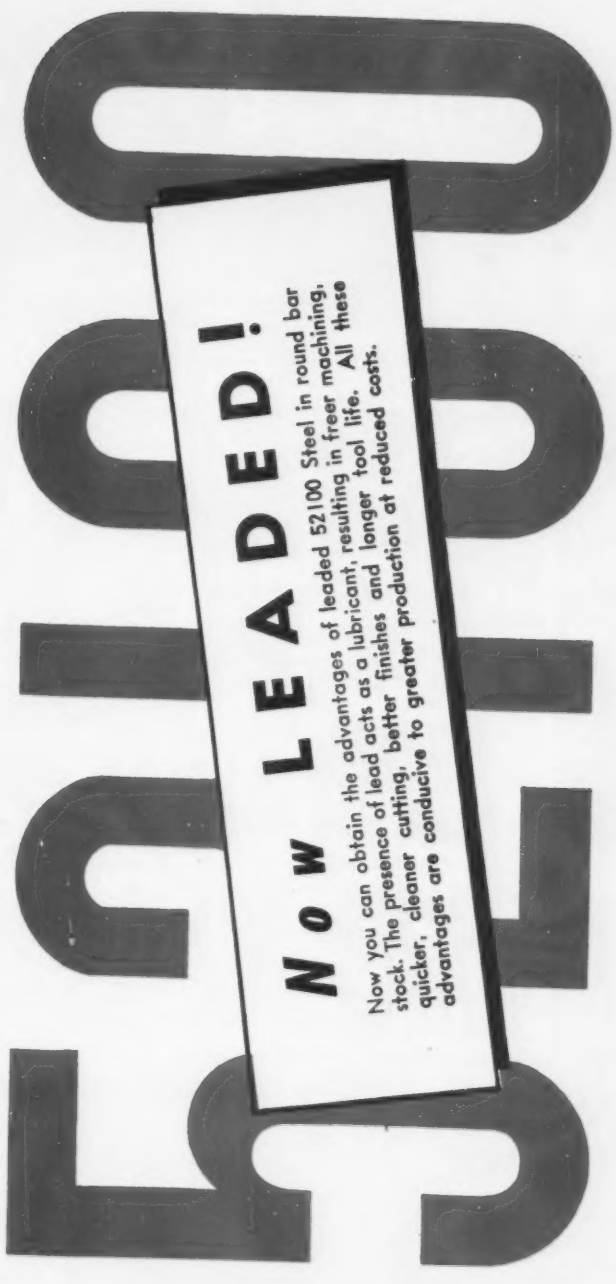
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Winter general meeting, Jan. 30-Feb. 3, Hotel Statler, New York. Society headquarters, 36 W. 46th Street, New York City.

FEBRUARY

NATIONAL INDUSTRIAL ELECTRIC HEATING CONFERENCE — Annual meeting, Feb. 6-10, Netherland Plaza Hotel, Cincinnati, O. Society headquarters, 420 Lexington Ave., New York.

PRIVATE TRUCK COUNCIL OF AMERICA, INC. — 17th annual convention, Feb. 9-10, Cleveland Hotel, Cleveland. Society headquarters, Sheraton Bldg., Washington 5, D. C.

AMERICAN MANAGEMENT ASSN.—Mid-winter personnel conference, Feb. 15-17, The Palmer House, Chicago. Society headquarters, 1515 Broadway, New York.

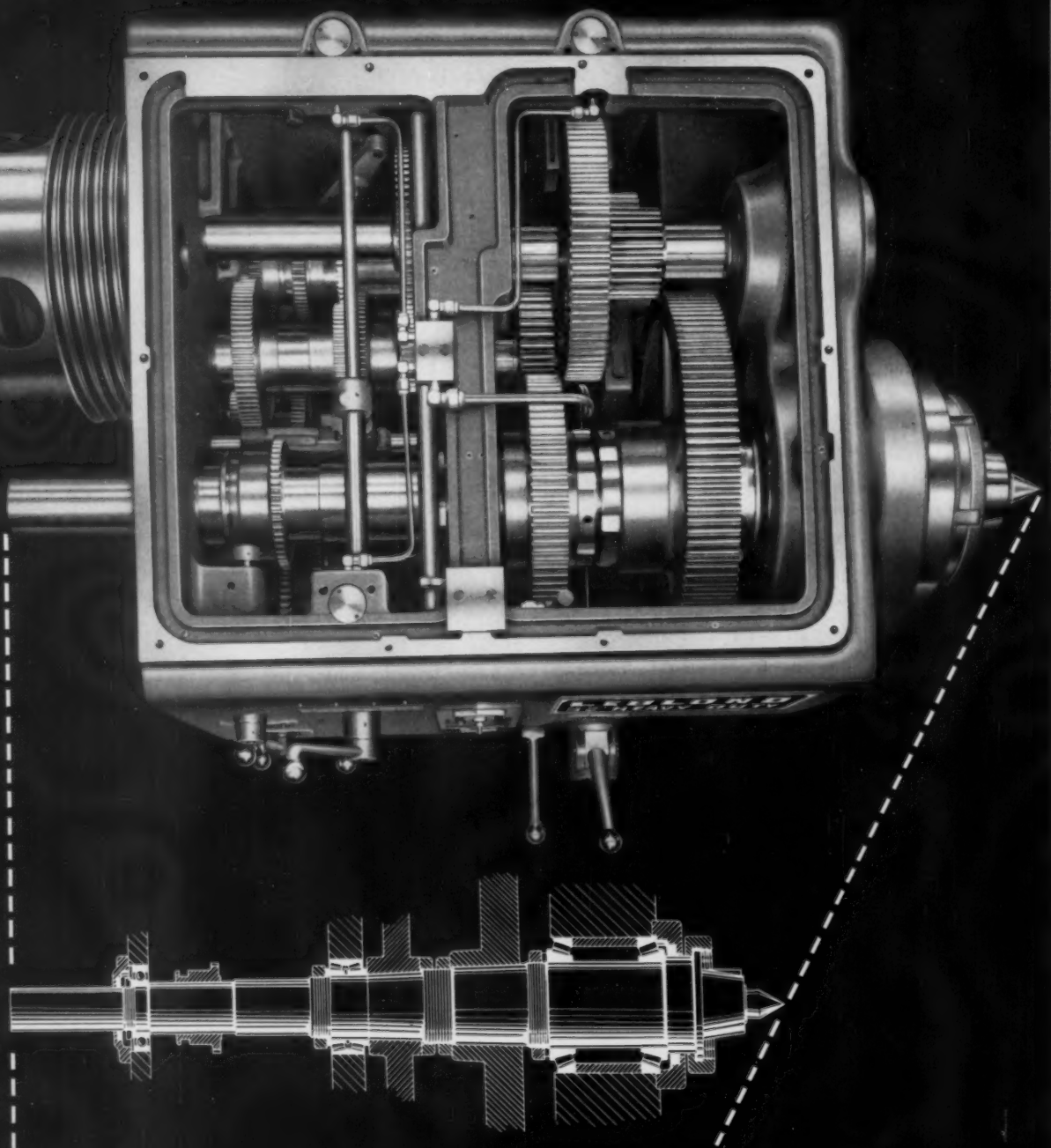

NOW LEADED!
Now you can obtain the advantages of leaded 52100 Steel in round bar stock. The presence of lead acts as a lubricant, resulting in freer machining, quicker, cleaner cutting, better finishes and longer tool life. All these advantages are conducive to greater production at reduced costs.

PHONE OR WRITE TODAY
FOR COMPLETE INFORMATION
DEPT. I

55-3

PETERSON STEELS, INC.
UNION, NEW JERSEY
Detroit, Michigan • Chicago, Illinois

Designing LeBlond lathes for



Take a look inside the new LeBlond headstock—designed from the ground up to deliver high horsepower effectively.

60·HP turning was an inside job

This new headstock is the power secret of the LeBlond 32″ Heavy Duty.

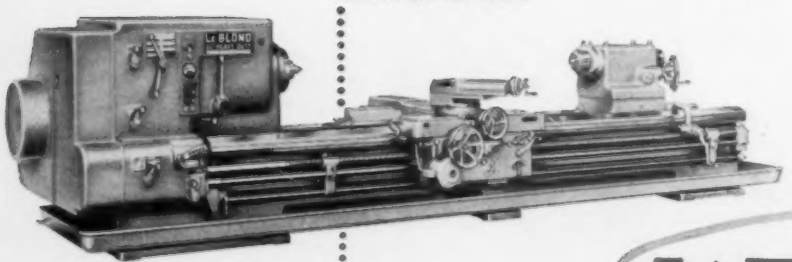
Notice how short and heavy the shafts are—to minimize deflection. Look at the fine-pitched, wide gears—for better tooth action and greater load-carrying capacity. They're hardened and ground for all speeds except low back gear. Free-running spur gear design assures minimum no-load friction horsepower. Shafts and gears not needed for a given speed remain idle, do not consume any power. The new 4-bearing spindle gives maximum rigidity, has twin Timkens at front, double-row Timken at center, ball bearing at rear.

Of all the lathes in the world, the LeBlond 32″ Heavy Duty was selected by a leading manufacturer of carbide tools, to be modified for grueling laboratory tests. Using 125 hp drive, cuts were made with a measured 118 hp at the tool—*210 cubic inches of SAE 1045 removed per minute!*

Results like this call for a machine built in every detail for high-horsepower turning. The new headstock design is typical of the engineering in every element of the new LeBlond 32″ Heavy Duty. The totally-enclosed quick change box, the hardened rack, 4-directional power rapid traverse, hardened and ground steel bedways, thrust-lock tailstock.

Whatever your turning needs—high power or high production, small swing or large—LeBlond makes a lathe you can trust with the job. 76 different models to choose from. Today, see your LeBlond Distributor or write—

36 speeds, new adjustable acceleration. From 4.5 to 500 rpm. New and exclusive adjustable acceleration brings heavy work pieces up to speed safely; any percentage of full torque can be selected for the first five seconds. Similar adjustments can be made for stopping and jogging, by means of three rheostatic controls to the electric clutch and electric brake. Hydra-Trace duplicating attachment optional. Write for Bulletin HD-165 for full details.



...cut with confidence

LeBLOND *of Cincinnati*

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 69 YEARS*

New Case "400" Tractor, shown here, is setting new standards of tractor capacity, convenience comfort, appearance and over-all performance.

Many parts of YOUNGSTOWN Steel go to make Case's "new from ground up" 400 Tractor

Not often does a farm equipment manufacturer create an entirely new tractor. Such a change is costly—both in time and in tooling costs. But, the J. I. Case Company of Racine, Wisconsin, did it with the Case "400" Tractor.

Another thing that Case did was to make sure that the "400" would be a quality product. That's why parts such as 4th and 8th speed gear seat reinforcement, rear axle shaft, differential shaft, reverse idler gear, front wheel spindle and many others are of Youngstown Steel. These parts utilize 5 different Youngstown Steel products: Hot Rolled Alloy Bars, Hot Rolled Carbon Bars, Hot Rolled Sheets, Cold Rolled Sheets and Standard Black Pipe.

In all Youngstown Steel products, you will find the same dependable uniformity, because Youngstown controls the complete manufacture from start to finish, with emphasis on quality throughout.

Let Youngstown help you with your steel problems. For information and service, get in touch with the local Youngstown distributor—or phone our nearest district sales office.

Youngstown

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

SUITABLE FOR FRAMING...

Suitable for Reynolds Aluminum Window Frames to be specific!

Reynolds makes lots and lots of window frames for lots and lots of people . . . just because they *are* so suitable!

That so-called "suitability" is a combination of proper design and appealing price. As *you* well know, design and price depend on the method of fabrication and its cost. And suitably enough, Reynolds uses Sciaky Resistance Welding to produce those frames.

If *you* combine good design and appealing price like Reynolds does, you'll have "lots and lots" of customers to make your efforts profitable, too!

SCIAKY®

Largest Manufacturers of Resistance Welding Machines in the World

Don't take our word for it — turn the page and look at the facts for yourself.

Production increased 66%, unit costs reduced 25% with Sciaky Resistance Welding

How old is "antique"?

Recent Sciaky technical achievement in resistance welder design may make welders only five years old obsolete.

Production limitations, high operating cost, and greater maintenance requirements make these "antiques" expensive to own. You can't be competitive if the cost of your product won't let you compete.

Aluminum window frame production jumped 66% with two Sciaky 200 KVA Flash Butt Welders at the Reynolds Metals fabricating division in Louisville, Kentucky.

Three arc welder set-ups and five expensive jigs were eliminated. Labor demand for the welding operation was reduced 43%, releasing skilled men for other important work.

The Sciaky resistance welders now provide a completely water tight frame. Rejects are virtually eliminated. Maintenance has been reduced to minimum routine service. With all these advantages, it's easy to understand the 25% lower unit production cost.

"Resistance Welding At Work," Vol. 4 No. 7, details the Reynolds story. Write today for your free copy of this dramatic proof of Sciaky basic design thinking—welders to do *more useful work* at *lowest operating cost* with *maximum reliability.*

Largest Manufacturers of Resistance Welding Machines in the World

SCIAKY®

Sciaky Bros., Inc., 4912 West 67th Street, Chicago 38, Ill., Portsmouth 7-5600

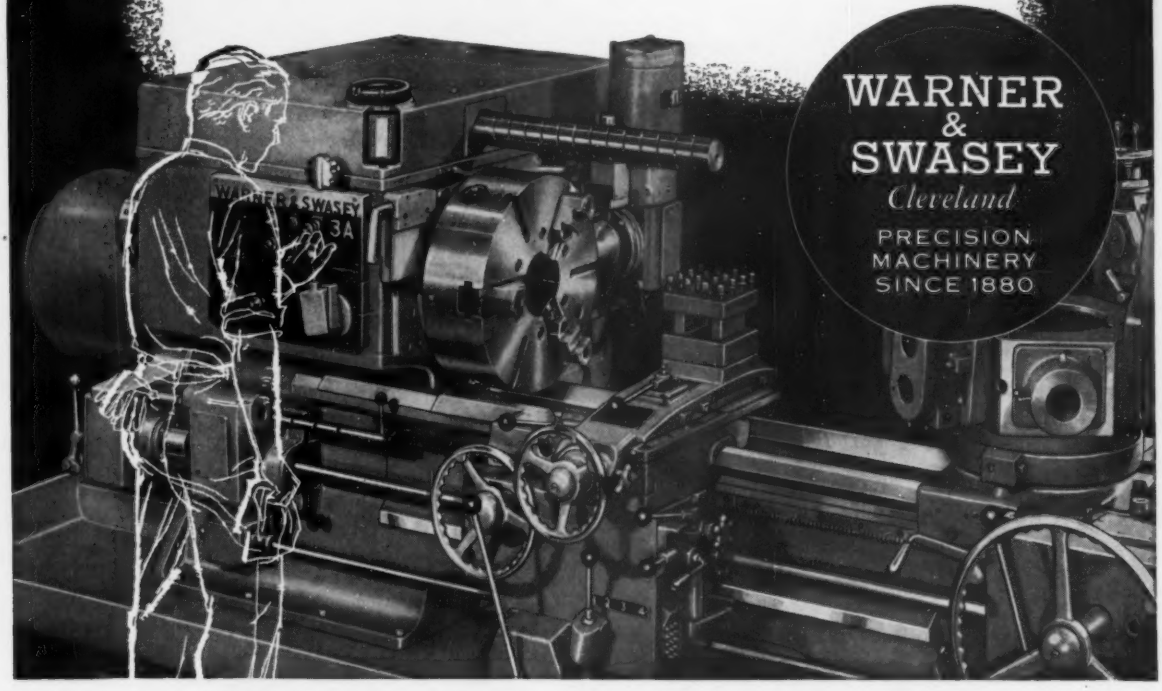
BIG...POWERFUL...ACCURATE...VERSATILE...

AND YET SO EASY TO OPERATE!

Warner & Swasey turret lathes have become more powerful, more versatile, more accurate, more productive—and yet much *easier* to operate.

Operators of the new extra-heavy duty saddle types like, for example, such Warner & Swasey advantages as the ease of spindle speed selection . . . the effortless speed changes . . . the easy indexing turrets . . . powered rapid traverses . . . zoned operating controls throughout . . . the high-speed hydraulic bar feed with adjustable feed-out . . . and bed design that permits them to stand closer and more comfortably to the work.

And, like all Warner & Swaseys, this new line of saddle type turret lathes give you traditional Warner & Swasey accuracy and dependability!

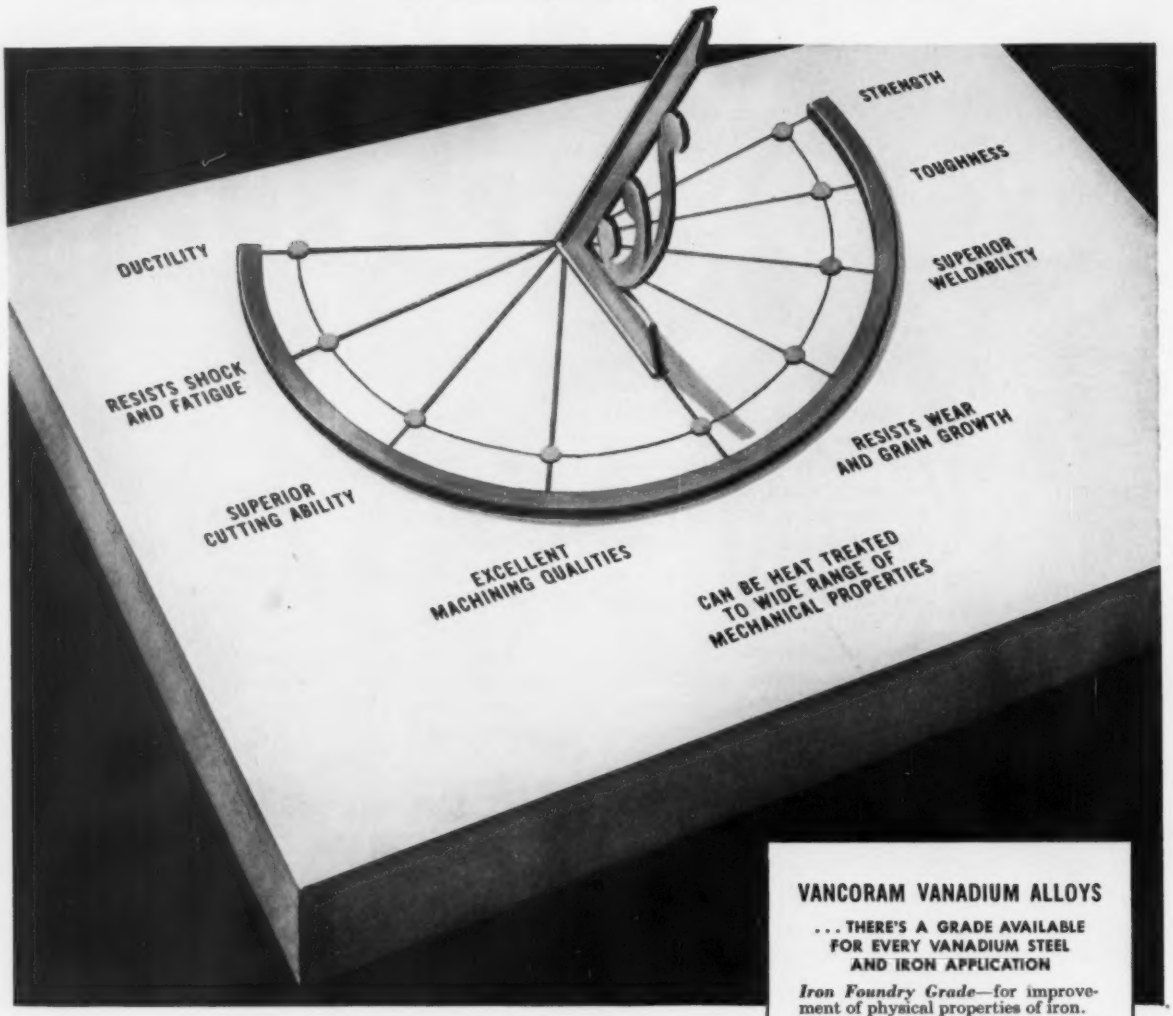


WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

VERSATILE VANADIUM STEELS

for almost any property under the sun...



If you have a problem of meeting tough specifications, vanadium may help you do the job.

Either alone or in combination with other alloying elements, vanadium—in the form of Vancoram ferrovanadium—is one of the most versatile and dependable of alloying elements added to steel. It enhances the effect of other alloys and serves to improve the physical properties of the metal.

Just call our nearest sales office and we'll be happy to send a Technical Service representative to discuss your problem and offer recommendations.

VANCORAM VANADIUM ALLOYS

... THERE'S A GRADE AVAILABLE FOR EVERY VANADIUM STEEL AND IRON APPLICATION

Iron Foundry Grade—for improvement of physical properties of iron.
Grade A (Open Hearth)— for low vanadium steels and vanadium cast irons.
Grade B (Crucible)—for tool steels and other high-vanadium steels requiring a limited silicon addition.
Grade C (Primos)—for making the highest vanadium and the lowest silicon addition to tool steels.
Vanadium Metal (90% grade)— for special iron-free (nonferrous) or low-iron alloys, or for low impurity ferrous alloys.
Vanadium Pentoxide, Tech.—a source of vanadium in basic electric-furnace steels. A base for numerous chemical compounds.

VANADIUM CORPORATION OF AMERICA
420 Lexington Avenue, New York 17, N. Y.
Pittsburgh · Chicago · Detroit · Cleveland

VANCORAM

Producers of alloys, metals and chemicals

Here's one feature all 1956 cars have in common ...thanks to AMERICAN

Any auto show will quickly show you a "familiar face", literally millions of times over . . . the good-looking, unmarred head of the *Phillips* cross-recessed Screw. For it's a matter of record that, since American first introduced the Phillips Screw to industry, auto makers have come to use more and more of these modern fasteners until now most of the industry is standardized on Phillips . . . as one look at your own car will tell you.

And why has Phillips fastening been so widely adopted in the world's most cost-conscious, competitive industry? Ease of handling . . . speed and straightness of driving . . . unscarred work-surfaces, uninjured workers, no rejected work, no lost time. In fact, time savings overall run up to 50%. *So the auto industry knows that Phillips Screws always cost least to use.*

And many auto makers bank on American to keep their assemblies rolling without a hitch. For they know that American has the volume capacity and the inflexible inspection systems that assure prompt delivery of top-quality Phillips fasteners of any type, size or metal. Likewise, *you* can get fastener problems off your mind once for all . . . *just turn them over to American.*

✕ *marks the spot . . . the mark of extra quality*

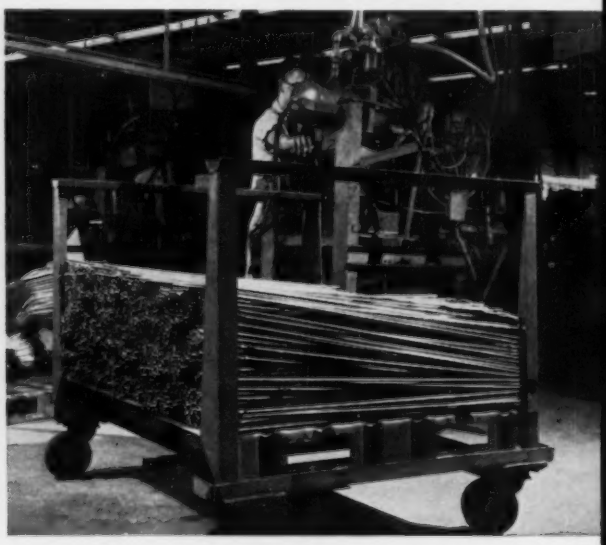
AMERICAN SCREW CO.

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn. and at Norristown, Pa.
Warehouse and office at Chicago
Office, Detroit, Michigan

Inverted, Republic Stacking Racks permit long lengths of tubing to overhang without dragging on floor. They also serve as work tables during fabricating.

PR-15 Racks are easily stacked to practical heights regardless of the bulky material they contain.



Mounted in normal position on steel dollies, racks provide ease of movement of tubing from one operation to another.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

How Republic stacking racks help solve a "Hang-over" problem

Franklin Products Company, Franklin, Michigan, manufactures automotive and aircraft fuel and hydraulic lines in varied lengths up to ten feet. Republic Stacking Racks, used in their normal position mounted on steel dollies for mobility, are ideally suited for handling coils and shorter lengths of tubing. However, the longer lengths, bent at sharp angles, present a problem. The tubing frequently has too much overhang for the racks in their normal position and as a result the tubing drags on the shop floor.

To solve this "hangover" problem, Franklin Products have simply inverted the racks on the dollies. The height gained provides plenty of room for overhang and prevents the tubing from dragging on the floor. This double usage of Republic Stacking Racks speeds both handling and fabricating. It has resulted in several other advantages. In the inverted position, the racks serve as work tables during the various tube fabricating operations and at a comfortable operator height. They are also used for transporting tubing from one operation to another.

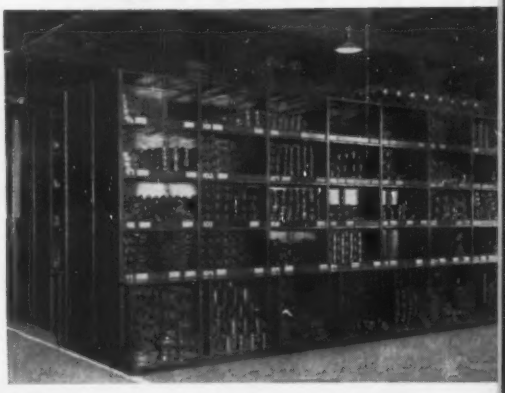
In conventional use, Republic PR-15 Stacking Racks are especially adaptable to packaged materials that do not require the use of sides. Construction features permit easy entry by fork or platform truck. Sides and bottom corners are designed to permit stacking of racks to any practical height either loaded or unloaded.

Give you an idea for your shop or plant? Then contact your Republic Materials Handling Equipment Dealer. He has all the facts on PR-15 Stacking Racks or on the many other types of materials handling equipment made by Republic's Pressed Steel Division. Or write us for more information.

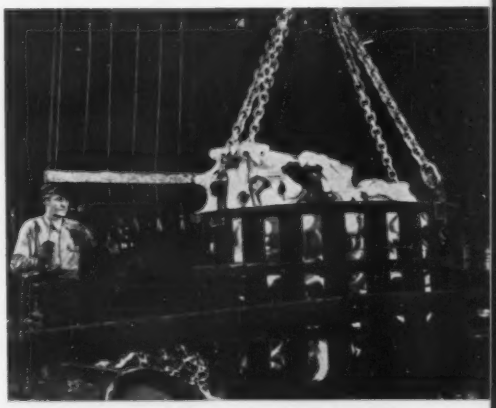
STEEL

and Steel Products

Here are More Problem-Solvers from Republic



WEDGE-LOCK STEEL SHELVING made by Republic's Berger Division provides maximum loading in minimum floor space. It's designed for high stacking of heavy items with no sagging, swaying or buckling. Joints actually get tighter as weight increases. Wedge-Lock Steel Shelving is completely flexible. It can be assembled quickly and easily. Write for literature and full information.



CHAIN SLINGS, ATTACHMENTS AND ACCESSORIES are supplied by Republic's Chain Division in Alloy Steel, High Test Steel and Wrought Iron. They provide an exceptionally high degree of safety in numerous handling operations. All Republic Chain Slings are proof tested and warranted to meet or exceed specifications. They are made in any length to meet your requirements. Write for new catalog.

REPUBLIC STEEL CORPORATION
3104 East 45th Street, Cleveland 27, Ohio

Please send more information on:

☐ PR-15 Stacking Racks ☐ Chain Slings
☐ Wedge-Lock Steel Shelving

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

K-9695

PORTAGE

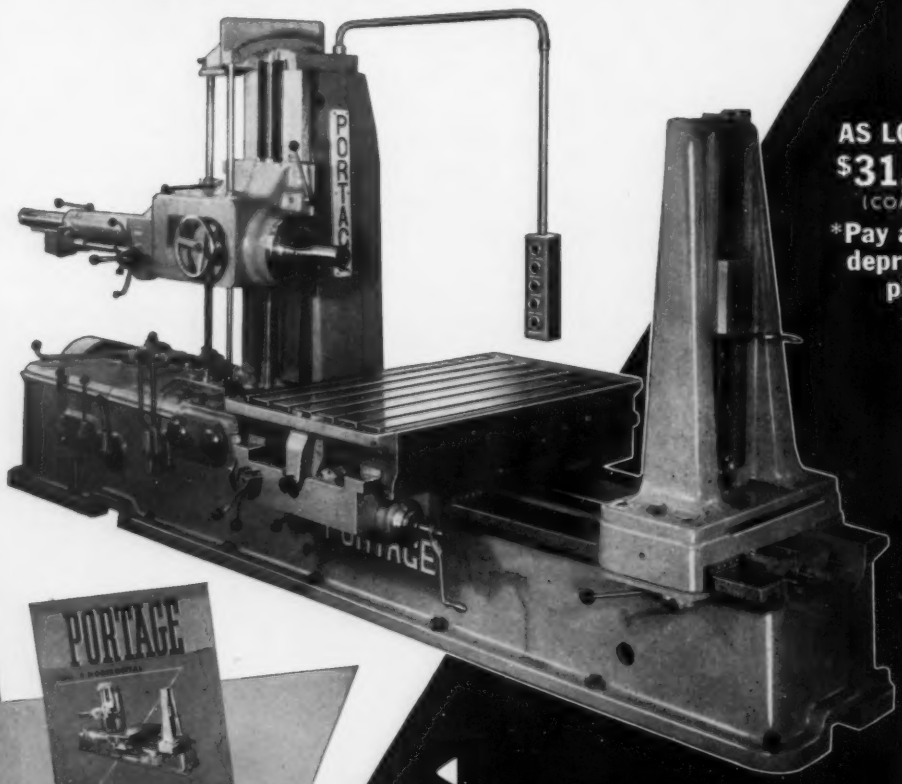
(4" Diameter Spindle)

Horizontal Boring, Drilling & Milling Machine

Outstanding . . .

MACHINE OF THE YEAR

Unsurpassed in Price and Quality



AS LOW AS
$31,358
(COMPLETE)
***Pay as you depreciate plan**

Write for Catalog today!

The PORTAGE Boring, Drilling & Milling Machine offers a *real* saving in new machine investment. PORTAGE mills cost from 5% to 20% *LESS* than present comparable makes . . . and the amazing part of this savings is the machine itself . . . Write today for literature covering all the specifications and features on the PORTAGE Mill.

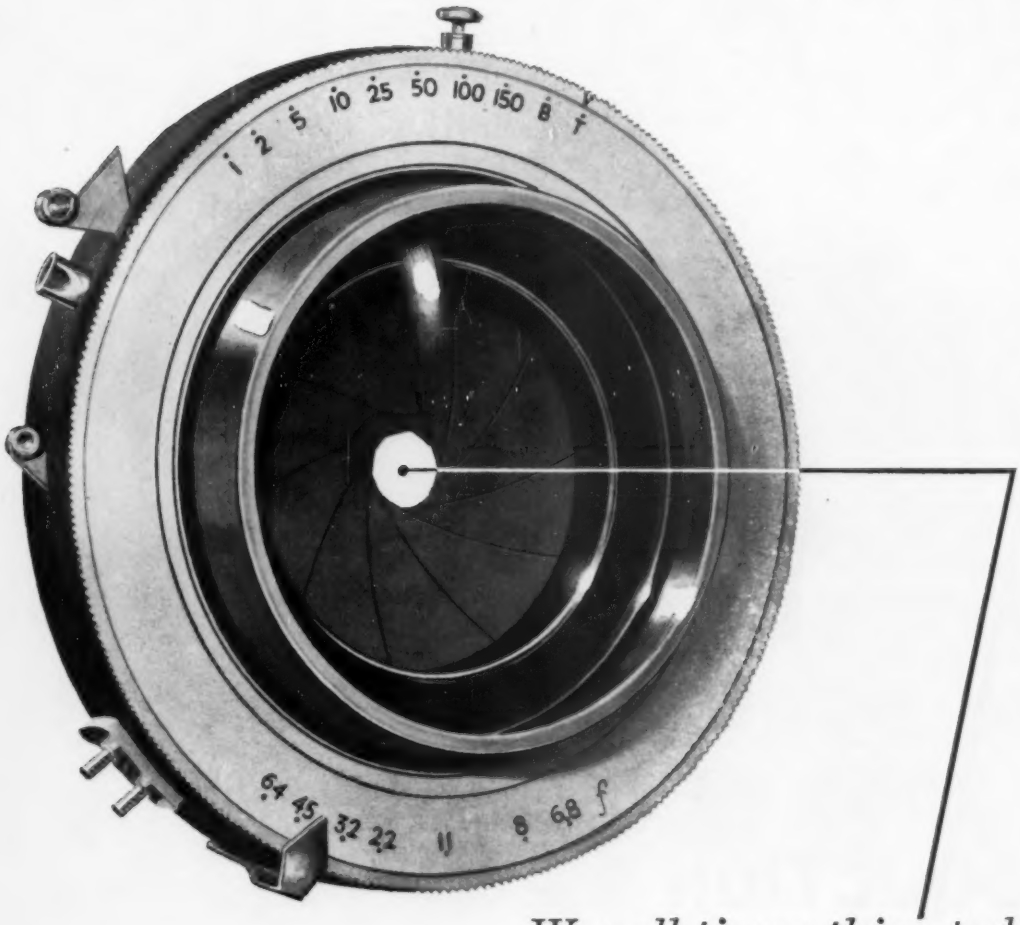
*** For full particulars, phone the factory today!**

THE PORTAGE MACHINE CO.

1035 Sweitzer Avenue • Akron 11, Ohio

Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916



We roll tissue-thin steel so flat

a camera's eye shuts tighter

Camera shutters are incredibly fast and accurate. To permit this speed and precision, *Athenia Steel Division* rolls tough alloy steel to a thickness of .002" . . . with a tolerance of only .0001".

But the toughest part of the job is keeping the steel extremely *flat*. It requires skill of the highest order, plus constant supervision and meticulous control.

The *Athenia Steel Division* of National-Standard produces this steel for the foremost camera makers, meeting these really tough specifications better than they've ever been met before.

Tough jobs like this are routine at *Athenia*. We can roll the fussiest kinds of steel to remarkable tolerances.

We can meet any demands for high carbon strip steel. But we excel at producing the types with specifications so extreme that other manufacturers cannot or will not meet them. And we are just as eager to serve the small manufacturers as the big ones. Write us and see.

NS NATIONAL-STANDARD Company NILES, MICHIGAN

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape

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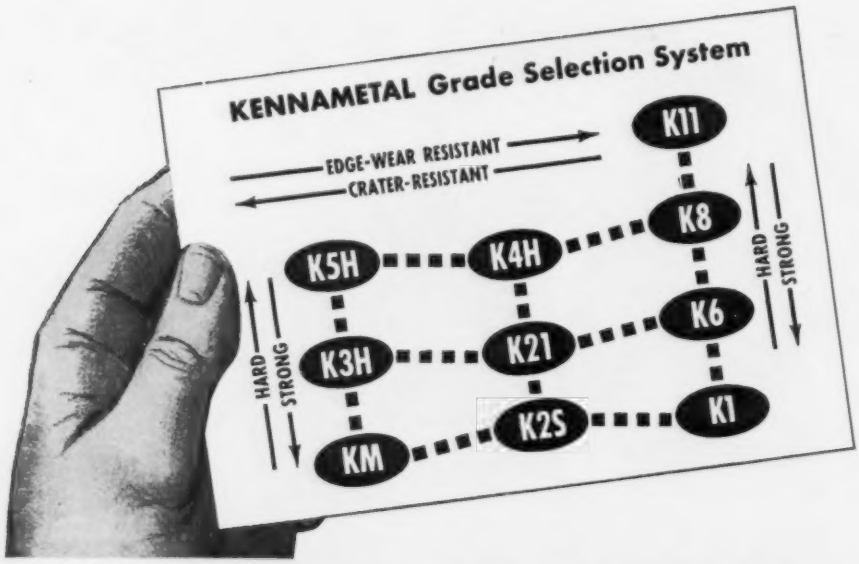

EXACT GRADE SELECTION NOW MORE VITAL THAN EVER ON YOUR NEW HIGH PRODUCTION MACHINES

Many metalworking shops are drifting along in a sea of profitless operation due to improper tool selection. Numerous shutdowns for tool replacement or regrinding, excessive tool breakage, or shortages along the production line due to tool trouble . . . all can shoot costs sky-high . . . make the difference between profit and loss.

Often it's just a matter of selecting the right tool and grade for the machining operation. When you specify Kennametal engineered tooling and the right grade of Kennametal,* you are giving your machines the BEST. You get consistent top performance at every step in your operations . . . from the first run through each regrind, insert after insert, tool after tool.

But be specific . . . specify the *exact* grade. A Kennametal Tool Engineer will gladly help you select the right grade for each operation. He works exclusively with Kennametal . . . applying and servicing it. He can show you reports of Kennametal's *consistent* repeat performance on all types of machining operations. KENNAMETAL INC., Latrobe, Pennsylvania.

KENNAMETAL* Grade Selection Guide makes grade selection quick . . . easy . . . positive

The Kennametal Grade Selection Guide groups Kennametal grades according to strength, hardness, and wear characteristics. For example, it pinpoints the new K21 as a medium grade ideal for general purpose steel-cutting. If greater edge-wear resistance is required and the job permits a harder grade, K4H would be the choice. If cratering is excessive, the choice would be to the left, or grade K3H. Thus, the guide offers a selection of high crater-resistant, intermediate and high edge-wear resistant grades at each hardness level.

PROVED BEST . . . TEST AFTER TEST

Grade K6 increased production of transmission drive gears to 70 from 25 by switch to 8-spindle, 20-tool operation.

Grade K3H machined up to 400 swivel joint flanges per grind, against previous top of 20.

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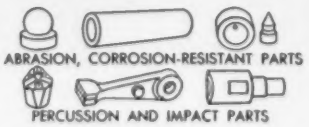

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It's outstanding!

EVERY MANUFACTURER who tries Roebling high carbon flat spring steel discovers the same thing... that this spring steel is absolutely unexcelled for dimensional and mechanical uniformity... for speeding production and cutting down rejects.

You always *pay* for the best when you buy flat spring steel... make sure you *get* it by specifying Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

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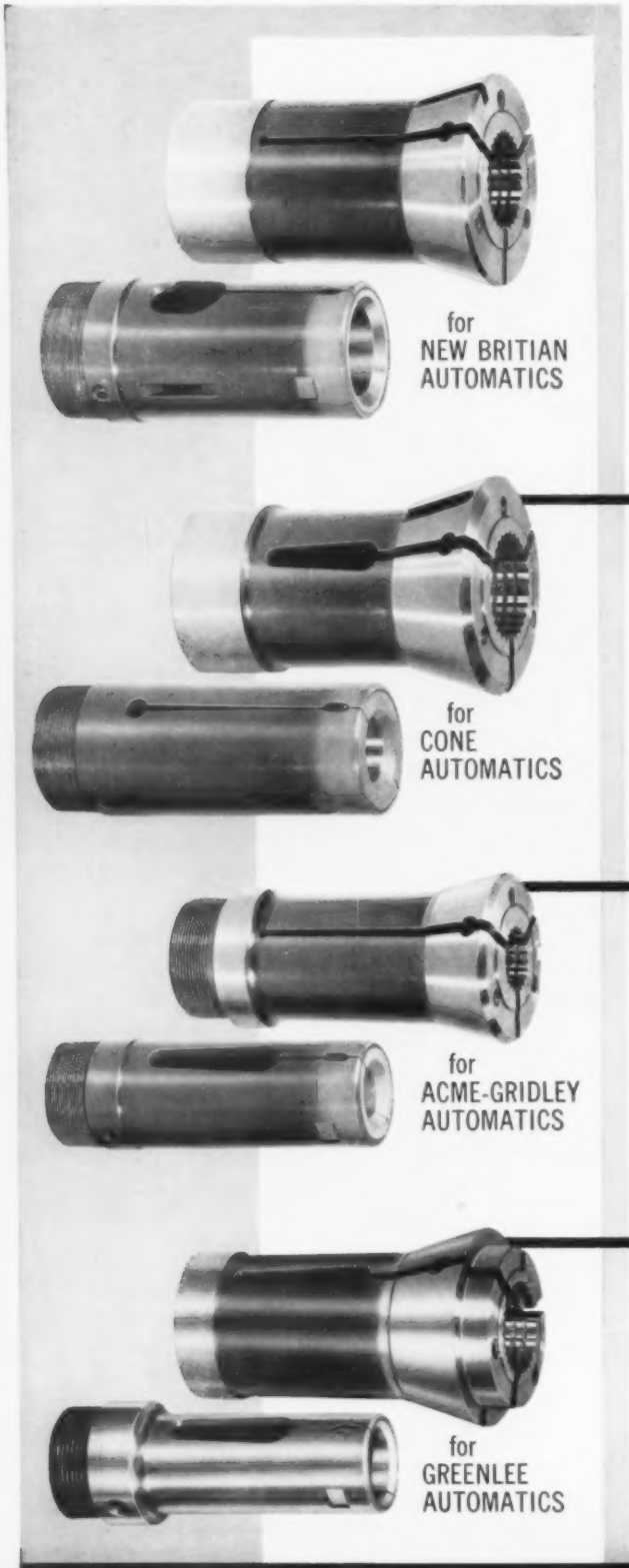

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Hardinge Style "S" Master Collets
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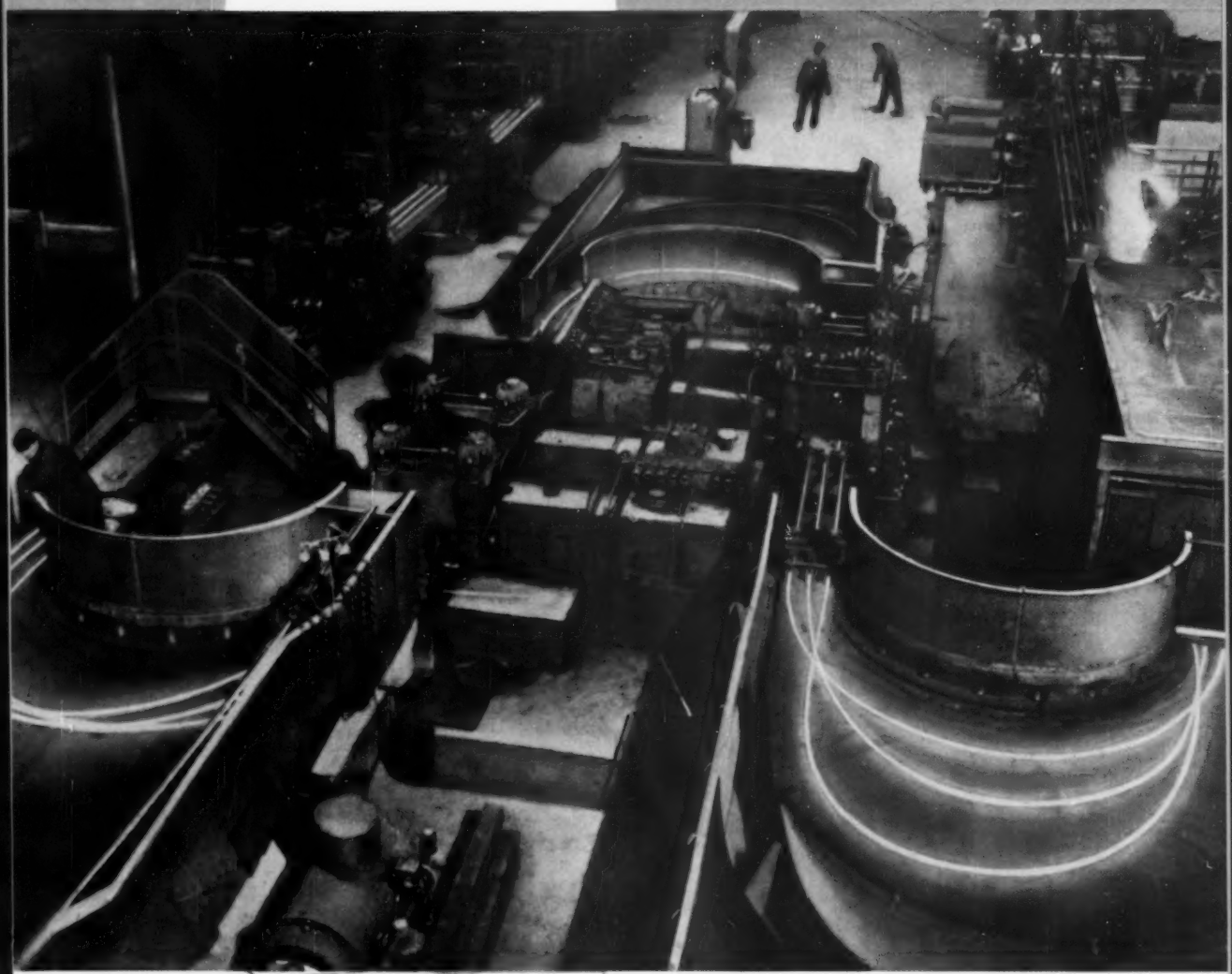

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- **LOWER ROLL and GUIDE MAINTENANCE COST.**
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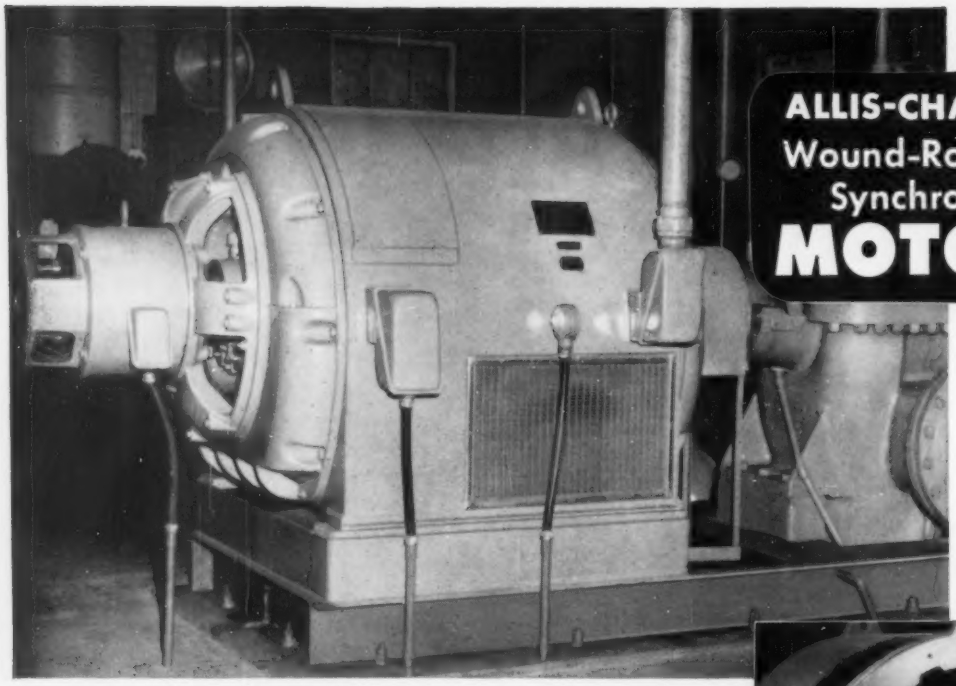
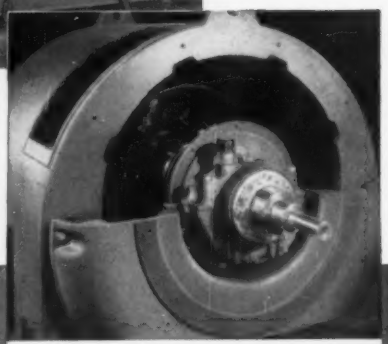


ALLIS-CHALMERS
Wound-Rotor and Synchronous
MOTORS

Shown is a 400-hp, 900-rpm end-shield bearing synchronous motor. Other Allis-Chalmers motors of this design are available from 250 hp at 300 rpm and up, in drip-proof and splash-proof construction.

Now full protection without loss of accessibility

All parts, including slip rings and leads, are enclosed — yet removable inspection covers and end-shield sections simplify maintenance.



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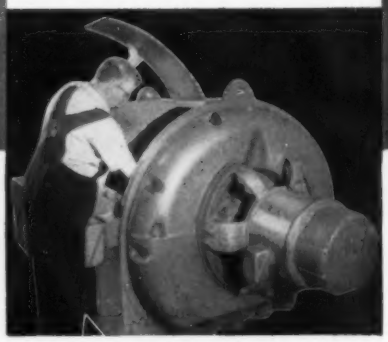

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- Slip-ring leads are brought out to a terminal box — they are not left exposed.
- Capsule-type sleeve bearings permit inspection or cleaning of motor windings without exposing interior of bearing to dirt.
- Access covers are secured by easy-operating, self-locking fasteners for ready removal.

Get details — Call your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 05R8183.

A-C ALLIS-CHALMERS

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A-4847

NEWSFRONT

Possibility Of New Ore Deposits

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Air Force generals are putting on pressure for a big increase in research funds. They say the U. S. is in danger of losing the race for technical superiority in the air to the Reds. They want Congress to vote an increase in the current $570 million air research budget to permit hiring the best brains and engineering skills in the U. S. In comparing U. S. air engineering know-how with Russia's, one top official says we're still ahead—but just barely.

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New plastic insulated cable withstands temperatures up to 220°F which is 60 pct higher than previous maximum temperatures. It should prove useful where high operating temperatures formerly affected serviceability.

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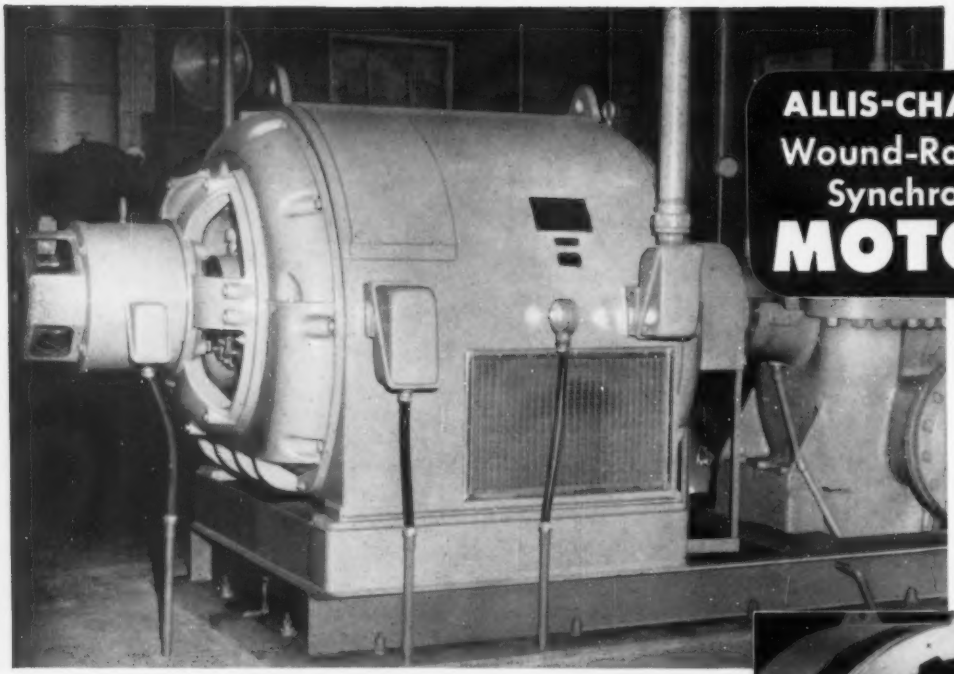

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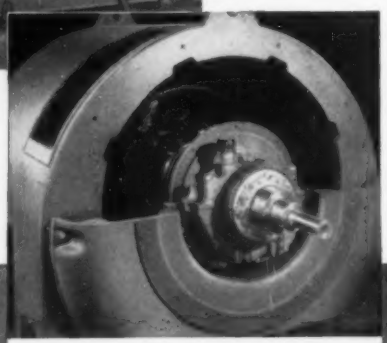

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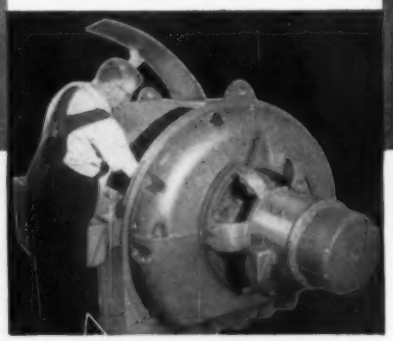

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TIMKEN® bearings ended lubrication headaches on this hot mill 29 years ago

WHEN Wheeling Steel purchased this hot-strip mill in 1927, they specified Timken® tapered roller bearings for the roll necks on the work rolls and back-up rolls. These bearings have given extremely satisfactory service for the past 29 years while using economically applied, low-cost grease for bearing lubrication.

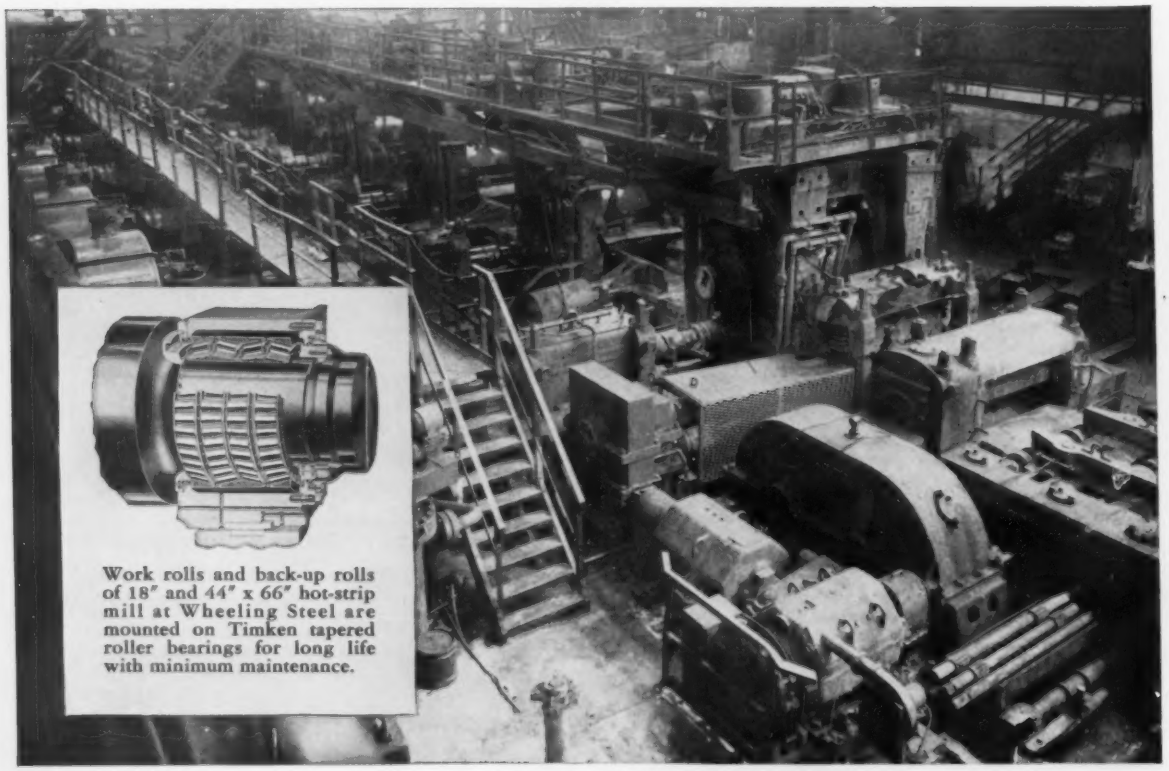
Their experience with grease-lubricated Timken bearings proves that there's no loss of lubricant during roll changes. Moreover, rolls can be changed in less time. And Timken bearings make closures more effective and reduce loss of lubricant because they keep the roll neck concentric with its chock.

Using Timken bearings will simplify mill designs all around. No special thrust units are needed because Timken bearings take both radial and thrust loads in any combination.

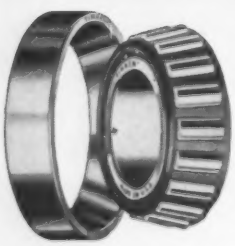
Timken bearings have exceptionally low frictional resistance—the result of true rolling motion based on proper geometric design and precision manufacture. This low friction reduces starting resistance and permits mills to accelerate more rapidly. Higher mill speeds are possible. Skidding or scuffing between work roll and back-up roll is reduced.

Timken bearings can be applied to machinery of any type to make it run better and last longer. Look for the trade-mark "Timken" on the bearings in the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



Work rolls and back-up rolls of 18″ and 44″ x 66″ hot-strip mill at Wheeling Steel are mounted on Timken tapered roller bearings for long life with minimum maintenance.



TIMKEN

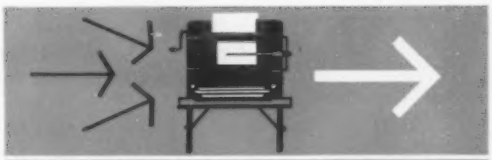
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

ROLL NECK BEARING ENGINEERING SERVICE

Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings. Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◐ AND THRUST ⊣◐⊢ LOADS OR ANY COMBINATION ✳



DISPERSAL: Where's the Incentive?

Industrial concentrations invite damaging attack and weaken our defense position . . . Present dispersal measures inadequate . . . See need for stronger dispersal incentives, realistic planning.

◆ HOW ARE YOU going to lure industry into the wide-open spaces?

Defense planners are beginning to realize it will take more than patriotism and fast-tax relief to do the job. Efforts to move industry away from war-time target areas are making slow progress. Main trouble seems to be lack of a real incentive.

Some interesting ideas have been advanced, but nothing much has been done about them—on the surface, at least. These include special consideration in the awarding of defense contracts, and tax reductions based on distance away from highly-industrialized areas.

Meanwhile, here are the facts on the vulnerability of U. S. industry to attack from the air:

Ten well-placed H-bombs would jeopardize over 80 pct of the country's steel production. Over half the nation's steel comes from four regions: Chicago-Gary, Pittsburgh, Philadelphia, Youngstown.

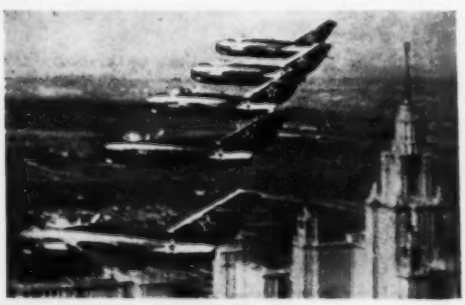
Over 70 pct of all defense production comes from 50 areas.

Ninety pct of the coal for steelmaking is supplied by belts centering in West Virginia, Pennsylvania, and Alabama.

Nearly 90 million tons of iron ore came from the Great Lakes region last year.

Today's H-bombs have an incen-

WHY DISPERSAL IS VITAL



◀ **THE THREAT**

Behind these Red jets are 1000 intercontinental bombers and nuclear stockpile to devastate 68,000 sq mi.

THE DEFENSE

Despite best in missiles and jets, kill ratio is only 30-40 pct. Rest of attacking force would get through. ▼

THE WEAKNESS

Ten areas contain production of 51 pct of primary metals, 46 pct fabricated metal products, 55 pct of electrical machinery, 56 pct of transportation equipment. ▼

diary range of 25 miles. They spread radioactive rays over an area of 7000 sq mi.

One of the few specific programs of dispersal inducements comes from mobilization planner Marshall Wood. He suggests permanent tax reductions for defense industry in sparsely settled areas.

See Broad Need

Mr. Wood sees a need to encourage not only new construction in these regions but also the juggling of production among existing facilities. Defense items would be made in outlying plants of a company; consumer goods would be produced in target-area plants.

To avoid buildups in favored areas, tax cuts would be graduated according to population density. A plant located in a community of 10,000 might receive a 10 pct tax reduction. If the population increased to 20,000, corporate taxes would go up 1 pct.

Mr. Wood says that ". . . if 78 pct of the normal private investment over the next 10 years were channeled into dispersed areas, we could have . . . as much dispersed industrial capacity as we had total capacity in 1950."

Jones & Laughlin's Admiral Moreell points out that if we replace present steel capacity at the rate of 3 pct a year and put all new construction in dispersed sites, we will have dispersed 25 pct of our steel production in 8 years.

There is evidence that industry would cooperate with any program that reduced the penalties of dispersal to reasonable proportions. Under the restricted benefits of the fast tax program, nearly 80 pct of the projects okayed met dispersal standards. Special assistance might be needed for unusual requirements. Admiral Moreell sees housing for dispersed steel workers costing $1.25 billion; but for the most part, private capital could do the job.

For the immediate future, a clear assessment of dispersal needs is called for. At present, the military services set up tentative schedules of wartime production with private companies. About 1000 long lead-time items and 25,000 plants are covered by plans.

War Damage Worries

But these plans do not allow for the production loss that is sure to be a part of general war. New Air Force policy on industrial readiness attacks the problem indirectly by identifying the classes of production that must be maintained at all cost. Losses in this area would be made up elsewhere.

The question is, would an attack on prime target areas leave enough production for the minimum war requirements of the armed services? With 70 pct of all defense production coming from target areas, the answer is no.

Experts agree that minimum production requirements should be spelled out for all services and that dispersal incentives for the building of the minimum defense production set up at once.

But as things stand, industrial dispersal is lagging as far as any planned effort goes. The fast tax program is on its last legs. Procurement policy statements are quick to qualify dispersal aims with cautions against economic and social dislocation.

Best the Office of Defense Mobilization can do is call on Government agencies to "encourage and, when appropriate to require" that new facilities important to national defense be located out of harm's way and be constructed so as to resist damage by bombing.

Sen. Bennett, R., Utah, has introduced a bill that would ask the Defense Dept. "to require dispersion, where feasible, in granting all future contracts." Sen. Bennett also would like a special advisory committee appointed to study industrial dispersion.

A 13-man committee appointed to review the so-called "Project East River Report" on civil defense complains that progress in

How Dispersal Can Be Achieved

Government Inducement: Proposed tax reduction for dispersed industry. Taxes graduated with population concentration.

Industry Effort: Jones & Laughlin's Admiral Moreell proposes dispersal of steel capacity by building 18 one-product plants.

Company Effort: American Machine & Foundry Co. has plans for underground plant in Alabama. May cost less than conventional plant.

decentralizing industry has been disappointing. It takes a crack at ODM for lack of interest.

Says the committee:

"There has been some dispersion of industry. For the most part, the dispersion program has been addressed to those commercial facilities that play a key role in the production of military items. The Federal dispersion program has been far too limited."

What They Want

The committee claims that the principal production problem in event of war may well not be military surpluses and weapons, but basic items needed for rehabilitation and reestablishment of the entire economy. It calls on the Government to take the lead and set an example in new Federal construction. In addition, it says, the Federal Government must contribute substantially through development of standards and incentives.

Meanwhile, companies and localities can get dispersal advice from Office of Area Development in the Commerce Dept. Cases are decided individually, on the basis of terrain, building material and so on, with no attempt to apply a nationwide yardstick.

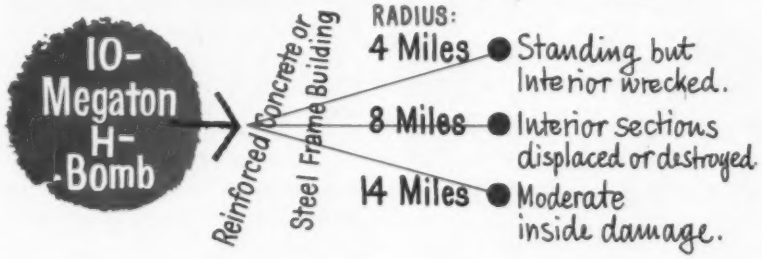
Modified dispersal plans have been put into effect by many companies. These call for no shift in production facilities but provide for relocation of essential functions and documents.

American Machine & Foundry Co. is selecting an alternate company headquarters for use in time of war. The Iron Mountain Storage Vaults are being used by New York companies to store microfilm copies of vital documents. Other companies are dispersing operating funds away from target areas.

Apart from dispersal, industrial defense measures include things like providing shelters; naming alternates to key men; drilling for raids; establishing communications; and providing medical care.

What One Bomb Would Do

H-bomb tests in Marshall Islands, as outlined by Chairman Lewis Strauss of the **AEC**. show bomb's destruction potential:



Wads of literature have been put out on these subjects by Office of Defense Mobilization, the Business and Defense Services Administration, and Federal Civil Defense Administration. A comprehensive defense planning manual was published by American Iron and Steel Institute for BDSA. American Machine & Foundry and other companies have detailed defense programs.

This activity is a step in the right direction. Nearly 80 pct of the damage of any nuclear blast will be outside the area of total destruction. Shelters and quick action can reduce casualties materially in these outer rings.

Meanwhile, reports of Russian nuclear activity emphasize the need for strong dispersal action.

U.S. STEEL Corp. places such value on its archives that it has an underground vault—a cave—in western Pennsylvania to protect them. This particular room contains over 43,000 cartons of paper records.

Based on a report by Neil P. Hurley, S. J., economics instructor at Fordham University. He has studied and written extensively on industrial dispersal, brings to the subject a background that includes degrees in accounting and political science, work with a Wall Street accounting firm, and contacts with top government and industry leaders.

TRANSPORTATION

INLAND WATERWAYS: Big Push is on

This year will set new production records for the nation's inland shipyards . . . Total launchings should hit well above last year's output . . . New designs serve many industries—By W. G. Brookfield.

◆ BIG THINGS are happening along the inland waterfront. Shipyards will be humming at top speed well into 1958. Barge traffic has tripled since 1946, and the trend continues up.

Here's the picture:

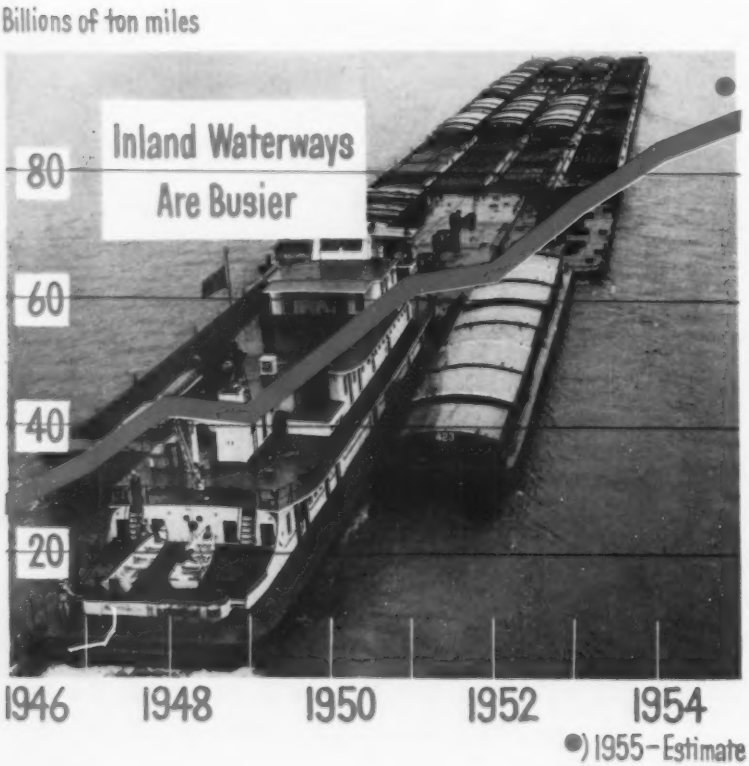
Many shipbuilders' order backlogs are already extended well into 1958. Dravo Corp., Pittsburgh, is heading into the year with orders for construction of 118 vessels. Last year, the firm turned out a total of 119 new craft.

In all, over 700 vessels slid down inland shipyard ways in 1955. All signs point to an even better record this year.

In the past 10 years, ton-mileage of barge traffic has tripled on the nation's 28,996 miles of inland waterways. Preliminary figures for 1955 indicate a step up to 87.5 billion ton-miles—a 5 billion ton-mile increase over 1954.

What's Behind Growth?

Behind the significant upswing in the growth of inland waterway traffic lie these factors: (1) decentralization of industry; (2) development of natural resources reserves in areas far removed from big population centers; (3) the rapid growth of the electric power industry, and (4) the increasing importance of low-cost bulk transportation.



The steel industry, a heavy user of river transportation for assembling its raw materials and fuels, and shipping its finished products, plans major plant expansions along inland water routes this year.

Likewise, a substantial boost in coal output in 1955, spearheaded by heavy demands from the electric power industry, will continue in 1956.

The electric power industry is building many new generating plants on inland navigation channels. These can take advantage of low-cost barge transport and water supply.

New waterside elevators mean a spurt in grain trade this year. Also, the sand and gravel industry expects to ship over 10 pct of its output by barge this year.

During 1955, waterside sites were selected for more than 500 new plants or major plant additions. Most of these are in the multimillion dollar class.

Tailor-Made Designs

Today's design and construction trends are more scientific in turning out vessels geared to performing specific tasks, hauling specialized cargoes.

Hopper barges still lead the list of vessels completed. There are also specially designed barges for chemicals, oil, grain, sand and gravel.

The use of dual-purpose barges has been expanded. These are towed on inland waterways by standard towboats. Later, they're hauled across open waters by an ocean going tug.

A Pittsburgh yard recently made history in launching two 4200 plus hp towboats, the most powerful twin-screw river vessels ever constructed.

COSTS: Are Your Phone Bills Zooming?

There are ways to keep business communication costs in line . . . Some firms are saving as much as $150,000 annually . . . Planned communications is the secret . . . Help is available from experts—By G. G. Carr.

◆ BUSINESSMEN too often treat their wives and their telephones the same way: They are resigned to the expense and take the results for granted.

How you treat your wife is your own business, but mishandling your wire communications can mean a lot of money down the drain.

According to William F. Hogan Associates, New York communications consultants, top executives rarely have any idea of their wire communications cost.

But business, says Bill Hogan, is paying too much for its wire communications. Costs can be cut. And in almost every case, more economical communications will mean more efficient service.

Huge Savings Cited

Planned communications policies can really pay off. One of New England's largest metalworking firms is saving $85,000 per year through improved communications. Two of the nation's leading construction products firms are saving $100,000 and $150,000, respectively.

A large East Coast metalworking firm reports its savings this way:

Long distance costs down 27 pct, telegraph costs up 6½ pct, total wire communications costs down 12 pct; long distance volume down 26½ pct, telegraph volume up 50 pct, total wire communications volume up 11½ pct, cost per message (long distance and telegraph) down 24 pct. And at least one company has been able to effect substantial tax savings plus a hefty refund.

Consult the Experts

For a complete and thorough program, your best bet is an independent consultant.

But there is considerable you can do yourself. (If you can't do it yourself, be sure that the man you select to do the job has (1) a good knowledge of your company's operations and (2) authority to issue and enforce the necessary instructions and procedures.)

The first step, suggests Hogan, is to forget about the chicken feed. Forget about local personal calls and the like.

Big opportunities are with long distance (toll) calls, teletype and Western Union.

Steps to Take

Next, get hold of all bills for wire communications. Selecting a representative month is the most common method, but you may want a longer period. When you are collecting the bills, make sure you also get a list of all wire facilities available in each office and plant. Analyze all messages to determine the stations between which the greatest number of messages pass. Forget about the once or twice a month calls from say, Dayton to Los Angeles.

At this point, you must apply two basic principles. First, assume that all messages sent were necessary messages.

The second principle reminds you that the vast majority of all messages are one way: They give information or instructions or request material which is not immediately available. Two-way conversations of any magnitude are the exception. Hence, many if not most of the messages on your bills could probably have been sent by teletype or Western Union (either regular service or your own teleprinter) at lower cost than by toll calls. Cutting calls does cut costs.

How To Cut Communications Costs

◆ CONSULT the experts. Independent consultants, the telephone company, and Western Union can suggest ways to keep communications costs under control.

Assign one or more of your best men to the job of ferreting out the weak spots. Give them full authority to enforce the policy finally decided on. Analyze your company's communications setup, problems.

Consider installation of teletype or teleprinter equipment. Most messages are one way. The teletype does the job and provides you with a permanent record, eliminates unnecessary conversation.

Take time out to chat with the head of your mailroom or your local postmaster. You may turn up a lot of unsuspected short-cuts and economies. It's still tough to beat the U. S. mails for speed and reliability purposes.

Special letters, documents, and the like can frequently be adapted to a special system of handling. Trick is to use the same priority messenger service as for telegrams at both sending and receiving stations but to transmit the material by air mail special delivery. This can often beat regular mail by several hours.

MARKETING

FASTENERS: How To Hold New Markets

Industry seeks to end market ups and downs . . . New, versatile products and marketing techniques provide answer . . . Improvements in manufacturing cut costs, make better products—*By T. M. Rohan.*

◆ INDUSTRIAL fastener business, once one of the most nervous segments of metalworking, hopes that new products and sales methods will take some of the tremors out of its production and sales records.

Despite some erratic ups and downs with general business conditions and inventory control, fasteners have registered general growth in sales volume, last year picking up a 35 pct gain in volume and tonnage over 1954.

Assuming major customers, automotive, appliance, railroad cars, construction and others, hold or continue advances, fasteners this year are looking for another 5 to 15 pct increase this year.

New Stuff

Some new wrinkles developing are:

Republic Steel has become the first major basic steel producer to set up a separate nut and bolt sales organization with its own group handling fasteners instead of traditional general line steel salesmen. Republic's fastener sales went up over 40 pct last year and the increase is expected to continue.

New cold forging processes and steady improvements of standard methods are also making it possible to produce many complicated parts by cold working rather than convention machining, according to Harry O. McCully, president of Russell, Burdsall & Ward of Port Chester, New York. This can be done on existing equipment with less waste of raw material and often at a saving in cost, equal accuracy and greater strength.

In addition, with recent changes in building codes in New York, Philadelphia and others, "there are good indications of increased use of high strength bolts." Despite higher cost than rivets, bolts have been making heavy gains due to faster, lower cost installation and absence of noise nuisance.

Tinnerman products of Cleveland, a leading auto fastener supplier, will shortly announce a new type spring steel fastener for auto and appliance moldings which will handle a wide variety of sizes. Working on a pinch-grip principle, these fasteners will replace several sizes, cutting material costs and speeding up assembly.

More Stainless

In stainless 300 and 400 series and nonferrous fasteners, aluminum doors and storm windows have increased sales 100 pct in 18 months for E. W. Ferry Screw Products, Inc. of Cleveland. Manufacturing economies have dropped prices about 15 pct from five years ago. Stainless and nonferrous fasteners are also increasing for aluminum doors, jalousies, and awnings, both in replacements and new home construction.

In special screws for automotive and appliance use, present backlogs are about 5-6 weeks. February orders for auto plants will probably be the best indicator for next year, according to Geo. Jenkins, National Screw and Mfg. Co. sales manager in Cleveland.

Demand Tops Supply

For the entire industry, 1956 promises to continue without letup, according to Mr. McCully.

"Demand has been running modestly ahead of the mills' ability to deliver, and our incoming orders topped shipments nearly every month in the second half.

"In this industry, you can't look too far ahead, but the future looks good," Mr. McCully said. "A 5 pct volume increase in the first half of 1956 appears to be a reasonable prospect."

Ups and Downs of Industrial Fasteners

▪ Index of dollar volume of industrial fasteners shows fluctuations of business with economic ups and downs. Fastener business is sensitive to trends and extremely vulnerable in periods of inventory control as indicated in the 1954 slump. Index is based on 1947 dollar volume at 100.

Year	Volume
1946	70
1947	100
1948	110
1949	82
1950	119
1951	158
1952	133
1953	147
1954	120
1955	160

BUDGET: Will Prosperity Lower Taxes?

President proposes $1.6 billion boost in Government spending, but hints at modest cut in individual taxes . . . Election-year politics may hike Federal outlays . . . Defense budget up—*By G. H. Baker.*

◆ A MODERATE across-the-board rise in Federal spending, sparked mainly by a $1 billion gain in defense outlays, is to be fattened up by an election-conscious Congress.

President Eisenhower's new proposal to boost Government expenses by $1.6 billion over this year's $64.3 total spending bill is regarded by congressmen of both parties as "only the beginning" in campaign-year politicking. Vote-hungry congressmen hint they'll pass as much as an extra half a billion dollars to the White House proposal for spending an extra $1.5 billion in the fiscal year that begins July 1.

Industry can anticipate easy Congressional approval of the President's request for raising defense expenditures by at least $1 billion.

In addition, there is widespread approval among members of both political parties for the White House suggestions on broadening the Federal stake in such programs as highways, health, social security, atomic energy, and foreign aid. There will be plenty of hot debate on Capitol Hill, but after the smoke clears, Ike will find that Congress has voted him just about what he asks for.

Budget Director Rowland Hughes confers with President Eisenhower.

"Go Slow on Taxes"

President Eisenhower is proposing not only a balanced budget for the current fiscal year, but also one for the 12 months starting July 1, as well. He warns Congress, however, against voting premature tax cuts. He reiterates his earlier warnings against tax reduction in place of debt reduction. It is important to note that he does not close the door on a reduction, nor does he threaten to veto any tax-reduction legislation voted this year by the Congress. In fact, he hints that Treasury Secretary Humphrey will "discover" in about 90 days that the Government's strong revenue position will permit "modest" trimming of Federal tax bills for individuals.

Of the total $65.0 billion new fiscal 1957 budget, Mr. Eisenhower proposes to spend nearly two-thirds (64 pct) for all the various defense activities which fall under the general term, "protection."

So-called "civil benefits" are to take 21 pct of the budget, and interest on the public debt will claim about 11 pct. Administration of the Federal Government will take about 4 pct of the total.

Defense Spending

In presenting his case for higher defense spending, Mr. Eisenhower cautions against our "being taken in" by Communist "smiles" or being "panicked by temporary crises." In order to safeguard our way of life, he suggests that Congress juice up Defense Dept. spending from this year's $34.6 billion to about $35.5 billion. And total military expenditures (Defense Department, atomic energy, foreign military aid) should be boosted from a grand total of $41.4 billion to about $42.4 billion, he suggests in his message.

Budget at a Glance

	1956	1957
RECEIPTS	$64.5	$66.3
SPENDING:		
Protection	41.4	42.4
Civil Benefits	13.8	13.9
Interest	6.9	7.1
Administration	2.1	2.2
Contingencies	.1	.2
TOTAL SPENDING	$64.3	$65.8

(In Billions of Dollars)

MANUFACTURING

INFRA-RED: It's Cooking With Gas

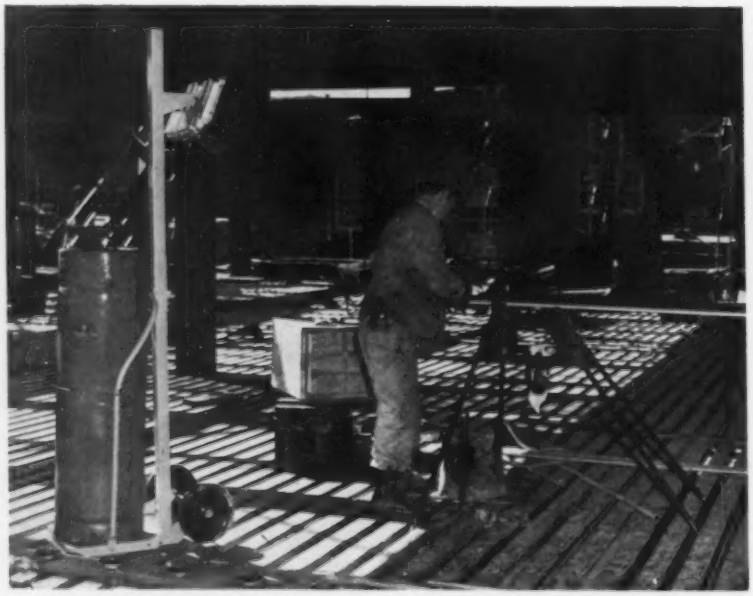
Gas-burning infra-red heater gets set to invade industrial field . . . Big potential seen in construction . . . Some work done in applying unit to fusing porcelain enamel to steel . . . Sales boom.

◆ ONE METALWORKING company holding a wildcat by the tail is Perfection Industries, Inc. of Cleveland. In fact, the wildcat may some day wag the company. In August last year the firm introduced a gas burning infra-red heater. By year's end it had shipped 10,000 units.

C. H. Foulds, vice president in charge of sales, says the firm should ship 100,000 units this year. In two years he expects the new units sales to represent up to 25 pct of the company's business.

Most of the infra-red heaters have gone into restaurants, patios, textile and paper drying and processing, and heating. But industrial and construction potential is beginning to materialize and may outweigh residential and commercial use.

The heater consists basically of a small cast iron or aluminum gas chamber with one open face covered by a group of small ceramic catalyst plates with 200 tiny holes per square inch, resembling a honeycomb. Each perforation is an individual gas burner and combustion takes place below the outside surface. Surface temperature hits 1400 to 1600°F, giving off intense infra-red heat which is beamed by reflectors.



EXTREME below freezing temperatures are no longer an expensive bugaboo of the construction industry. Pipefitters and men working in the semi-open can continue to build under warmth of an infra-red heater.

Industrial Applications

The heater was perfected by a German engineer, the late Gunther Schwank, and is licensed exclusively in the U. S. by Perfection. Over 1200 European churches are using them plus department stores and Parisian sidewalk cafes.

Most industrial applications are in the lower temperatures, but some work has been done on fusing porcelain enamel to steel at 1200°F, using two opposing units. Temperatures on material 8 feet away can be brought to within 5 pct of the temperature at the burner.

Through close control of the area heated, Perfection is predrying enamelware in its own plant at 400°F in 1½ minutes. It says the job formerly took 12 minutes with another type heater.

The first 10,000 units have been bought largely by homeowners for patios, and swimming pools; for heating circus tents and drive-ins. The world champion Cleveland Browns plan to keep the team even hotter on the bench with them next year.

Yet the industrial potential may outweigh these uses because of claimed cost savings, instant start-ups and direct control over the area heated. In the Cleveland area, for example, Perfection estimates they can be operated for a ninth the cost of comparable electric infra-red heaters.

Construction Field

Recently, the Air Force wanted an installation to keep an air strip 10,000 ft long and 300 ft wide clear of ice. It was considering a hot water system costing $10 million to build and $500,000 annually to operate. Perfection's bid based on the infra-red heater was $500,000 for the installation and $50,000 per year operating cost.

A Pittsburgh contractor is using it for melting broken asphalt for reclaiming, and reports an 80 pct saving in operation.

Construction offers a large field for spot heating.

TRADE: Czechs Lead New Red Drive

Current Soviet planning calls for Czechs to head up hard-hitting Red export drive . . . Russia and satellites will channel trade deals through Prague . . . New Communist markets are worldwide.

◆ DON'T EXPECT any letup in the mounting drive for world markets by Russia and her satellites.

Spotlight at the moment is focusing on Czechoslovakia's role in the Red bid for new long-term export-import contracts outside the Iron Curtain.

Current Communist planning calls for the highly-industrialized Czechs to spearhead the Reds' hard-hitting commercial drive. This means that Russia, Poland, East Germany, and Hungary will channel their exports through Czechoslovakia. They'll also step up their imports through the same gateway.

A good example of the plan in action is the recent Red arms negotiations with Egypt with the Czechs doing most of the ball carrying.

As the commercial nub of the East Bloc trade orbit, the Czechs will act as the buying agent for satellite materials. For this purpose and for export sales, they've already set up overseas holding groups such as "Omnipol" and "Magnipol."

In the last two years, Czechoslovakia has signed trade agreements with 31 nations, has established barter deals with 27 others. None of these is a Soviet satellite.

Lead Export Parade

This year the Czechs will be the leading Red exporter of iron, steel, machinery, and nonferrous metal products. Carefully camouflaged in the outgoing traffic will be all types of Russian, Polish, East German, and Hungarian products. Adding tinsel to the traffic stream will be numerous industrial fairs in dozens of foreign markets.

The Communists are shooting for big stakes in the world marketplace.

In 1955, for example, Czechoslovakia did $15 million worth of business with Denmark. Goal for '56 is $23 million. It did a $58 million business with the Netherlands last year. This year, they're aiming for $73 million. Czech business deals with India in 1955 came to $13 million. In 1956, this will be trebled.

Barter With Austria

The Czechs are now negotiating with India for construction of another $1 million ton capacity steel plant, while simultaneously constructing some 21 foundries in 14 countries. These include Burma, Lebanon, Syria, Uruguay, Norway, and El Salvador. Also, they're completing substantial railroad equipment deals with India and Turkey.

One barter deal worth noticing is that between Austria and its next door Red neighbor. This year, trade between the two nations came to over $25 million. Goal for the future is $70 million.

Austria will supply the Czechs vitally needed electric current, in return for Czech coal. Electric power is the key to the planned boost for Czech aluminum output.

Despite substantial light and heavy machinery export sales in 1955, Czech industry still can't meet its full market demands.

Russia and the satellites absorb the bulk of many products, especially power plant equipment, diesel locomotives, river steamers, and alloy steel.

Czechoslovakia can only supply the goods if Russia and her satellites combine their export drive through Czech organizations. This is actually happening.

On the other hand, the Czechs will act as the principal buyer for East Bloc chemicals, special steels, lead, molybdenum, cobalt and many other materials.

Reds Form Iron, Steel Community

▪ As an antidote to the European Coal & Steel Community, Russia and her satellites have set up their own Community of Steel & Allied Industries — or S.O.P.O.

The coalition takes in not only all the East bloc's iron and steel plants, coal, and iron ore mines, but also machinery plants, chemical, oil and cement.

In addition, the SOPO will control all river shipping, shipyards, and other commercial transportation in the eastern areas.

Program calls for initiation of a common iron, steel, ore, and cement market among the Poles, Czechs, and East Germans with other products following. In effect, the move means that prices and sales conditions will be equalized, iron ore, coal, and other resources will be combined, and common production programs will be established.

The new union's goal for 1957 calls for 140 million metric tons of coal, 14 million tons of pig iron, 17 million tons of steel, 11 million tons of cement.

COPPER: Mystery At The Mint

What's the lowdown on the current shortage of currency coppers? Fact is, says the Mint, the dearth of cents is long-range, serious.

Despite record output of 1¢ coppers, banks still clamor for more . . . Mint officials cite piggy banks, meters, taxes as likely depletion causes . . . Situation serious.

◆ MYSTERY AT THE MINT these days is where all the 1¢ coins being produced at unprecedented rate are going.

Best guess, say Mint officials, is that thousands of piggy banks, parking meters, vending machines, and the numerous local sales and payroll taxes are taking a big bite out of the estimated 20 billion coppers now theoretically in circulation.

Despite 24-hour, 7-day-a-week production of 3 million 1¢ pieces a day for the past several months, Philadelphia Mint officials say Federal Reserve districts are still clamoring for more red coppers.

Raw materials such as copper, tin, and zinc, say Mint officials, are currently equal to meeting their production requirements. Big headache, they point out, is keeping up with "consumer" demand which so far shows no signs of letup.

Alloy mix of the "copper" cent is actually 95 pct copper, 5 pct tin and zinc. Surprisingly, the 5¢ piece contains about 9 grains more copper than a cent.

1

2

3

4

5

1—INITIAL STEP in coinage production is cast-coinage ingot from hot metal alloy mix.
2—INGOTS are formed into strips through series of cold-rolled reduction passes.
3—BLANKING OPERATION shoots blanks into sorting lift which operates by electrical impulse.
4—CUT BLANKS are carefully inspected along belt-line sifter which eliminates duds.
5—NEWLY-STAMPED COINS spill into buckets for later weighing, counting, and bagging.

Support:

Industry-military talks will cover war preparations.

Eastern business executives are meeting with military planning officials in Philadelphia for a discussion of the job industry will have in a wartime mobilization period.

Sessions on Jan. 19 and 20 will feature talks on production preparedness measures, stockpiling, and general requirements for end-item output to support the defense effort.

Principal Pentagon personnel who will describe mobilization plans include Lloyd H. Mulit, director of Requirements, Procurement, and Distribution, Office of the Secretary of Defense; Maj. Gen. H. R. Westphalinger, chief of the Procurement Div., Office of the Deputy Chief of Staff for Logistics, U. S. Army; Rear Adm. R. L. Swart, vice chief, Office of Naval Materiel; and Maj. Gen. T. P. Gerrity, assistant for Production Programming, Office of the Deputy Chief of Staff, Materiel, U. S. Air Force.

Accompanying this team are Assistant Labor Secretary Rocco C. Siciliana; D. A. Hipkins, deputy administrator for procurement, Small Business Administration; and Maj. Gen. Lewis B. Hershey, Selective Service director.

A chief spokesman for industry will be Rear Adm. E. D. Foster, USN (Ret.), vice-president, planning, Radio Corp. of America. Contact man for executives attending is Arthur L. Rowland, with the U. S. Signal Corps, 225 S. 18th Street, Philadelphia. Sessions are at the Bellevue-Stratford Hotel.

Plan New Test Blasts

Nuclear blasts set for Eniwetok next spring will be used to develop defense measures. Bombs tested will be less powerful than those set off in 1954.

The announcement of the test goes to some pains to get away from any idea of scare talk or a nuclear race. Among other things, it points out that nuclear development must be carried on because Russia has rejected the plan for international inspection.

There was some speculation on the significance of the tests. Emphasis on the defensive character of the blast and the smaller bomb size of the bombs suggested that this country might be shifting the direction of nuclear effort.

Heretofore, primary importance has been attached to the relative power of U. S. and Soviet weapons. If means could be found to restrict or prevent enemy blasts, completely new defense thinking would be in order.

The aim would now seem to be to prevent or at least minimize an atomic explosion.

New Reactor Contract

Atomic reactor components have been ordered from Westinghouse Electric Corp. in an $8,242,895 Navy contract. Parts are said to be for a ship propulsion reactor, although no details on ultimate use have been furnished.

Same company has been awarded a $2,722,480 contract for ship turbine equipment. There was no word on intended use of turbines either, but since Westinghouse built the reactor for the initial nuclear-propelled submarine, there was speculation that new contracts were tied to the underwater craft now in construction or planned.

DEFENSE

Race:

Defense Dept. says U. S. keeps up with Reds.

Defense Secretary Wilson says this country's military position is not deteriorating. At the same time he promised a detailed evaluation of the defense program.

Speaking before the Senate Armed Services Committee, he rejected charges that recent Russian developments had left this country behind in the arms race.

The present program was designed for a condition of sustained readiness, he said. He expressed the belief that an examination of the program would show its soundness.

Stress Weapons

Essentials of the program, as he outlined it, are slightly increased ground forces, more sea power, and heavy emphasis on air power and nuclear weapons. Plans call for an Air Force of 137 Wings by 1957. Nearly all planes will be jet-powered in the new program.

NAVY'S largest icebreaker, U.S.S. Glacier leaves its snug, warm harbor at Port Lyttel, New Zealand for chilly duty farther south. It is headed for the icy wastes of the Antarctic where it will take a key part in the navy's latest south polar expedition, labeled Operation Deepfreeze.

EXPANSION IN INDUSTRY

Aluminum:

Ford, Reynolds sign biggest contract.

◆ TREMENDOUS potential of the automotive market for aluminum is behind the record contract between Reynolds Metals Co. and Ford Motor Co.

In announcing location of its new 110,000 ton reduction plant at Listerhill, Ala., Reynolds disclosed it had contracted with Ford to deliver 320,000 tons of primary aluminum over a period of 10 years.

Hot Metal

Ford will build a foundry adjacent to the plant and will receive most of the metal in molten form, apparently for cost and time saving direct use.

In Detroit, Ford indicated that the aluminum will be used for automatic transmission components, chiefly housings, a field in which aluminum has made greatest inroads into the automotive market.

(For more on automotive uses of aluminum, see Automotive News, p. 47.)

Reynolds has a reduction plant at Listerhill with an annual capacity of 50,000 tons. The new capacity will make the Listerhill operation one of the four largest aluminum smelters in the country. Cost will be between $75 million and $80 million.

Points to Shortage

Ford requirements will amount to less than one-third of the new plant production.

The agreement guarantees Ford a substantial amount of aluminum for its foundry operation, indicating that the company believes that the metal will be in short supply for some years to come. It also indicates that Ford may increase its per car use of aluminum significantly, possibly departing from conventional uses such as housings and trim.

Expansion Briefs

Superior Tube Co., Norristown, Pa.; new plant and office building on 15 acre site near present operations at Wapakoneta, O.

Koenig Iron Works, Inc., Houston, Tex.; new plant and offices in Houston; cost $425,000.

MB Manufacturing Co., div. of Textron American, Inc., New Haven, Conn.; expansion project aimed at reducing delivery lead time; double floor space, increase personnel by one-third.

Columbia - Southern Chemical Corp., Pittsburgh; expansion of research and product development; Barberton, O., plant.

Spinco Div., Beckman Instruments, Inc., Belmont, Calif.; new research and development center; $500,000 cost.

STEEL: New Expansion Forecasts Higher Prices

◆ A HIGHER LEVEL of steel prices will be necessary to finance projected expansion programs that will add 15 million tons of steel capacity within the next three years.

This was implied by Benjamin F. Fairless, president of the American Iron and Steel Institute, in announcing results of a survey by the Institute of expansion plans of the nation's steel companies.

"Steel's greatest problem today, as I see it, is to get the money required to carry the expansion that the country expects," Mr. Fairless said.

He pointed out that because "permissible depreciation allowances under the tax laws are inadequate to meet rising construction costs, steel companies are constantly being forced to use profit just to keep their present plants intact."

He says that money to be raised to meet the cost can come from either remaining profits or from savings of investors who are willing to invest capital in the industry.

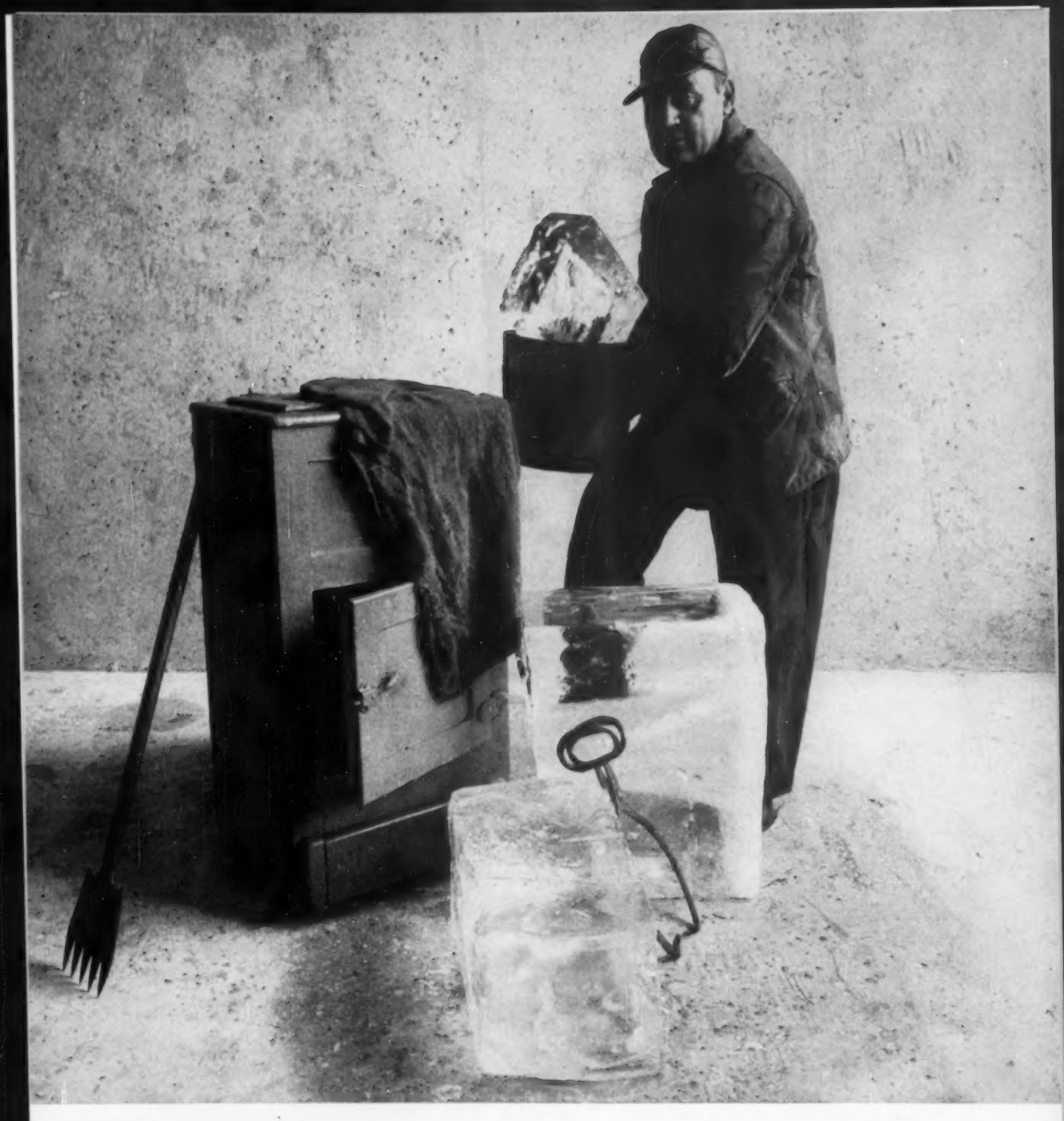
The obvious answer is that steel must raise prices to attract the risk capital necessary to finance the projected expansion.

An Iron Age projection (Nov. 24, 1955, p. 42) predicted an increase of close to 16 million tons of capacity by 1959. Editor-in-Chief Tom Campbell (June 23, 1955, p. 53) wrote that steel would go ahead with expansion plans to reach a capacity of 139.5 million tons by Jan. 1, 1959.

The Institute's survey shows that the increase, already under way, will be at the rate of 5 million tons a year, representing a sharp stepping up of the industry's expansion over the past 10 years, which was at the rate of 3½ million tons a year.

In 1956 alone, Mr. Fairless said, steel companies plan to spend $1.2 billion.

Mr. Fairless did not estimate the total cost of the expansion. The general rising price level makes cost projection complex. Furthermore, the variation of conditions among companies calls for expansion along different lines as circumstances may dictate.



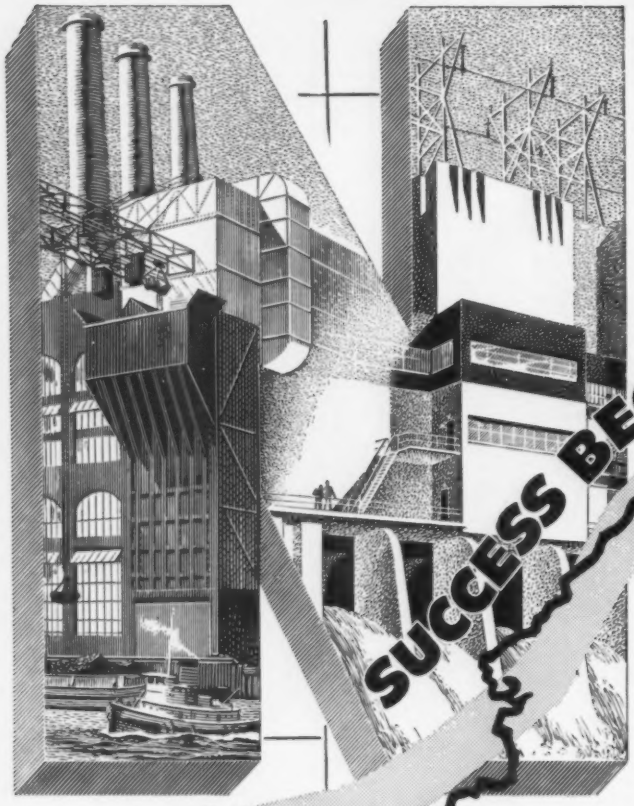
THE ICEMAN GOETH...

Ever stop to reflect on how American traditions are being quietly but constantly removed from the scene by progress? The iceman, for instance. In our day, the development of modern refrigerators and more than a hundred other household appliances has made life a great deal more pleasant. A vigorous and imaginative appliance industry has emancipated us from household drudgery.

New and better steels have played their part in this evolutionary process. And here at Inland, we've been pleased to work closely with appliance manufacturers, over the years, to provide the *right* steels for their products.

INLAND STEEL COMPANY *38 South Dearborn Street, Chicago 3, Illinois*
Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York • Steel products supplied to the appliance industry include hot and cold rolled sheets and strip, enameling iron sheets, electrical sheets, Ti-Co galvanized sheets, tin plate, black plate, bars. Other products: plates, structurals, 4-Way safety plate, reinforcing bars, rails and track accessories, coal chemicals.

INLAND



SUCCESS BEGETS SUCCESS

Development of power resources marches forward where the demand for power exists. More power is now generated and consumed in New York State than in any other. Enormous new power resources—thermal, hydro-electric and nuclear—are in course of development. Another reason why more industries—and a greater variety of industries—operate at a profit in New York State than in any other. A good reason for locating your plant in the Empire State.

New York State is prepared to give you the particular FACTS on which you can decide exactly where in New York to locate YOUR PLANT. Our booklet—"Industrial Location Services" explains what we do, and shows how you can put our knowledge to work. For your free copy write New York State Department of Commerce, Albany 7, N. Y

NEW YORK STATE

AVERELL HARRIMAN
Governor

EDWARD T. DICKINSON
Commissioner of Commerce

REPORT TO MANAGEMENT

Why You Have Personnel Problems

You don't have to be told that your firm has trouble getting (and even keeping) good professional, managerial and skilled men. And it's small comfort to realize that most others are in the same spot.

Openings for management positions are running about 60 pct ahead of last year, a percentage figure that hasn't changed much since October. The U. S. Dept. of Labor says that recruitment of engineers is increasingly difficult and this category "dominates occupational shortages."

And there's a limit to out-of-area recruiting, the conventional answer to personnel problems. For example, 40 states have out-of-area recruiting programs for electrical engineers, 42 for mechanical engineers. This amounts to the same end result as the old chain letter and is just about as useful under these conditions.

Plain fact is that shortage of skilled labor is not as critical as it is for management and professional men. Other scarce categories as well as engineers are accountants and auditors, chemists, draftsmen, laboratory technicians.

On the skilled labor side, machine shop workers, machinists, toolmakers, die sinkers and setters, continue to be in shortest supply.

But if you have good foremen, welders, sheet metal workers, electricians and mechanics, you'd better keep them reasonably happy. They can get jobs elsewhere in a minute. And don't forget your secretary. She's in demand, too.

What's Going on in Electronics?

In making your business plans for the next decade, don't neglect an industry that's growing at a rate of $1 billion a year. That's what is projected for the thriving electronics industry.

By combining growing markets in the home, industry and national defense, electronics will gross $10.8 billion this year, up about $1 billion from 1955. By 1965, the industry sales will reach $22 billion. This is the prediction of B. K. Wickstrum, vice president of Sylvania.

Government is still the best customer for electronics. Industry and commerce will buy less than $1 billion this year, compared with $2.5 billion by the government and around $1 billion just for home TV receivers.

You will have color TV in your home before you know it, too. In six years color television set sales will catch up with black and white. Even if you're not interested yourself, family pressure won't let you stay content with black and white when color sets are common in your neighborhood.

Watch Those Tax Deductions

There are a lot of fine points in tax planning that can cause your company and its employees a lot of headaches unless watched closely. Among them are vacation pay and fringe benefits.

Before deducting vacation pay, make sure the employee has "fully vested" rights. Vacation pay may not be deducted in 1956 unless vacation rights are vested. Businesses should review vacation pay plans to prevent loss of tax deduction.

Fringe benefits should also receive close scrutiny. It's possible that employees may be subsequently taxed on fringe benefits that they accepted under the impression that they were non-taxable. Careful planning on both vacation and fringe benefits is strongly advised by the American Institute of Accountants.

INDUSTRIAL BRIEFS

More Tanks . . . A new manufacturing plant expected to increase capacity by 40 pct has been built by General Welding Co., Bethlehem, Pa., manufacturer of fuel tanks.

Deal in Bronze . . . Copper and Brass Sales Co., Detroit, Mich. has been appointed distributor for continuous-cast Asarcon 773 bearing bronze, and related products of the American Smelting and Refining Co., Perth Amboy Plant, Barber, N. J.

Brake and Clutch . . . The Warner Electric Brake & Clutch Co., Beloit, Wis., will begin operations in a new 100,000 sq ft manufacturing plant by mid-1956. The $1 million project will be used almost extensively to produce the firm's automotive products.

Sticky . . . A new pressure-contact adhesive, part of a series designed to eliminate conventional bonding presses, clamps and weights has been developed by General Electric Co. New substance will bond wood, metal or composition materials, and can be applied by spray, brush or trowel.

Reduce Speed . . . Winsmith, Inc., Springville, N. Y., manufacturer of speed reducers, has purchased the Nunda, N. Y. plant of the Foote Construction Equipment Div., Blaw-Knox Co. The purchased organization will be known as Buffalo Assets Corp., subsidiary of Winsmith, Inc.

World's Only . . . World's only known sodium borate deposit, at Boron, Calif., has switched from shaft-tunnel to open pit mining in an effort to increase production and conserve the life of the mine. This is the major step in an $18 million development program.

Atomic Reactor . . . Westinghouse Electric Corp. has awarded a contract to Greer Hydraulics, Inc., calling for basic research and engineering on gas pressurizer apparatus in the primary circuit of an atomic reactor.

Mexican Sinter . . . Altos Hornos de Mexico, S. A. of Monclova, Mex. has awarded a contract to John E. Greenawalt for a sintering plant to be built at Monclova. The initial capacity is expected to be 900 tons of finished air cooled sinter per day. This is the first iron ore sintering plant to be installed in Mexico.

Rent Them . . . Dashew Rental Service has been formed as a wholly owned subsidiary of the Dashew Business Machines, Inc., Culver City, Calif. to make available an automatic metal plate embossing machine on a lease basis.

All Together Now . . . Norristown Magnesia and Asbestos Co., Norristown, Pa.; Sall Mountain Co., Hamilton, O.; and Valley Forge Metals Co., Lansdale, Pa.; formally wholly owned subsidiaries of Nicolet Industries, Inc., N. Y. have been merged with the parent company and will now operate as a division. Nicolet is active in the field of asbestos paper, millboard, insulation and metal products.

Buys Supplier . . . General Electric Co. has purchased substantially all of the assets of the Watson Flagg Machine Co., Paterson, N. J. The Paterson firm has been supplying gear motor components to G. E.

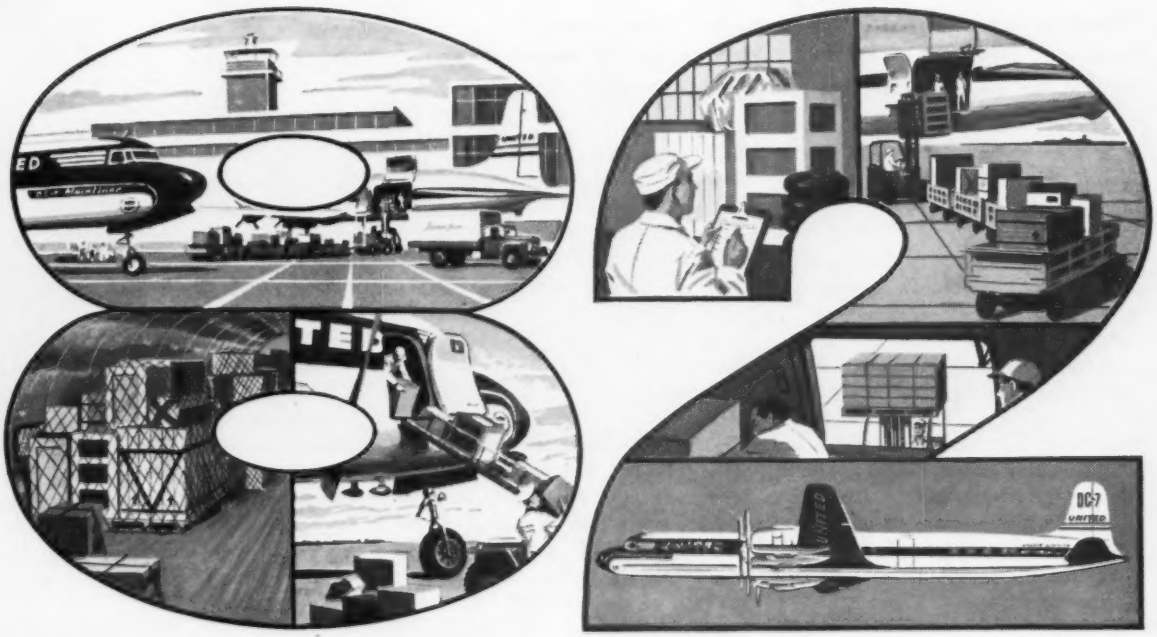
Scholarships . . . Mesta Machine Co., Pittsburgh, Pa., has awarded ten scholarships to outstanding freshman engineering students at the University of Pittsburgh and Carnegie Institute of Technology.

NEW MAYOR of Washington, Pa., is T. S. Fitch, chairman of board and president of Washington Steel Corp. Drafted to run only nine days before election, he still piled up substantial plurality.

Valves . . . Walworth Co., manufacturers of valves and pipe fittings, has purchased all of the outstanding common stock of the Conoflow Corp., Philadelphia, a leading producer of pneumatic automatic valve control equipment. Conoflow will be operated as an independent subsidiary without change in management, employees or present policy. Walworth issued 53,537 shares of its common stock for all the common stock of Conoflow.

Air Branch . . . A special projects engineering div. has been established within the engineering branch of Lockheed's Georgia Div. at Marietta for the purpose of rapid development of prototype aircraft designs and special systems.

ONLY UNITED AIR LINES Air Freight links the East, the Midwest and all the Pacific Coast—serves 82 cities

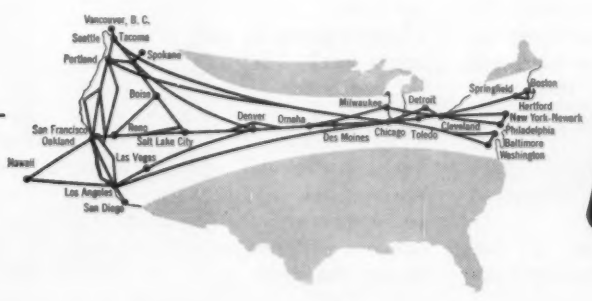


Whatever you ship, wherever you ship, here's an important fact to keep in mind. United Air Lines links more domestic markets in the East, the Midwest, along the Pacific Coast and Hawaii than any other carrier, air or surface.

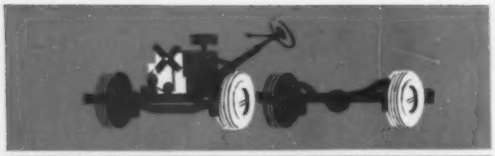
In fact, to enjoy the shipping coverage provided alone by United's Main Line route, you would have to call on 2 or 3 other major transportation systems.

Remember, too, United gives you fast, convenient connections at any one of these 82 cities on its Main Line Airway to speed your shipments to any other part of the nation or world. In coverage, convenience and all-out air freight service, United Air Lines is *first* among all domestic carriers.

Call the nearest United Representative or
write for free booklet, "Industry's Flying Partner."
Cargo Sales Div., Dept. IA-1,
United Air Lines, 5959 S. Cicero Ave., Chicago.



UNITED
AIR LINES



AUTOMOTIVE ASSEMBLY LINE

You'll Need Two Different Cars in '65

Trend to decentralized living makes two cars necessary . . . One for home use, other for highway . . . Electricity may power shopping special, but turbine has inside track for big highway car—*By T. L. Carry.*

◆ EVER SINCE the end of World War II, the imaginative auto buyer has looked for the evolution of a truly postwar car.

Although each new model brings new developments, better performance, and more driver aids, no automaker has been able to come up with a mass production car embracing all the technical advances the auto buyer sees and reads about in special jobs.

But it now appears that when the evolution is completed in about 1965, it won't be one car, but two cars. All signs point to development of two distinct types of automobiles.

Separate Functions . . . In a detailed prediction made to the Society of Automotive Engineers, scholarly University of Michigan faculty members have taken a long look ahead at future car development. The two car family is not only inevitable, but the trend is to cars of basically different design or function.

One will be a large auto which will be used for vacations, long trips and general highway use. The second will be a smaller commuter-shopping type of automobile.

Technical and scientific advances in all fields are going to leave the man of 1965 with more leisure time than ever before. As a result, the auto buyer will want more transportation to take advantage of his extended recreation.

Because of the trend to decentralized living and the increasing number of large families, the need for two cars will be mandatory by 1965. Here's a general idea of what you can expect in each type.

What They're Like . . . The small commuter-shopper car may be powered electrically. This is not only because its limited range will make that practical, but because of the increasing need of conserving natural resources.

The professors believe that this small auto need not have a range of over 35 miles per day or a top speed of over 35 mph. Its passenger capacity will be small, but it will have room for storing purchases and bundles. Storage battery power, however, would not be adequate for more than basic shopping requirements of a small car.

The vacation-type car envisioned for the future will be quite different from the small electric. It will be larger than our present day station wagons, yet lower and with a greater interior height. The lowness will result from the use of a front wheel drive.

Also, for the active, sports minded family, the car will have provisions for sleeping facilities which will accommodate three people.

Type of Power . . . The time may not be too far off when such a car will be on the road. Size specifications have already been drawn up at U. of M. Its wheelbase would be 125 in., overall length 215 in., overall width 80 in., tread 65 in., overall height 61 in. and road clearance 6½ in.

So much for the types of cars. The question is: How is the large auto going to be powered?

There are three possibilities so far as engines are concerned, re-

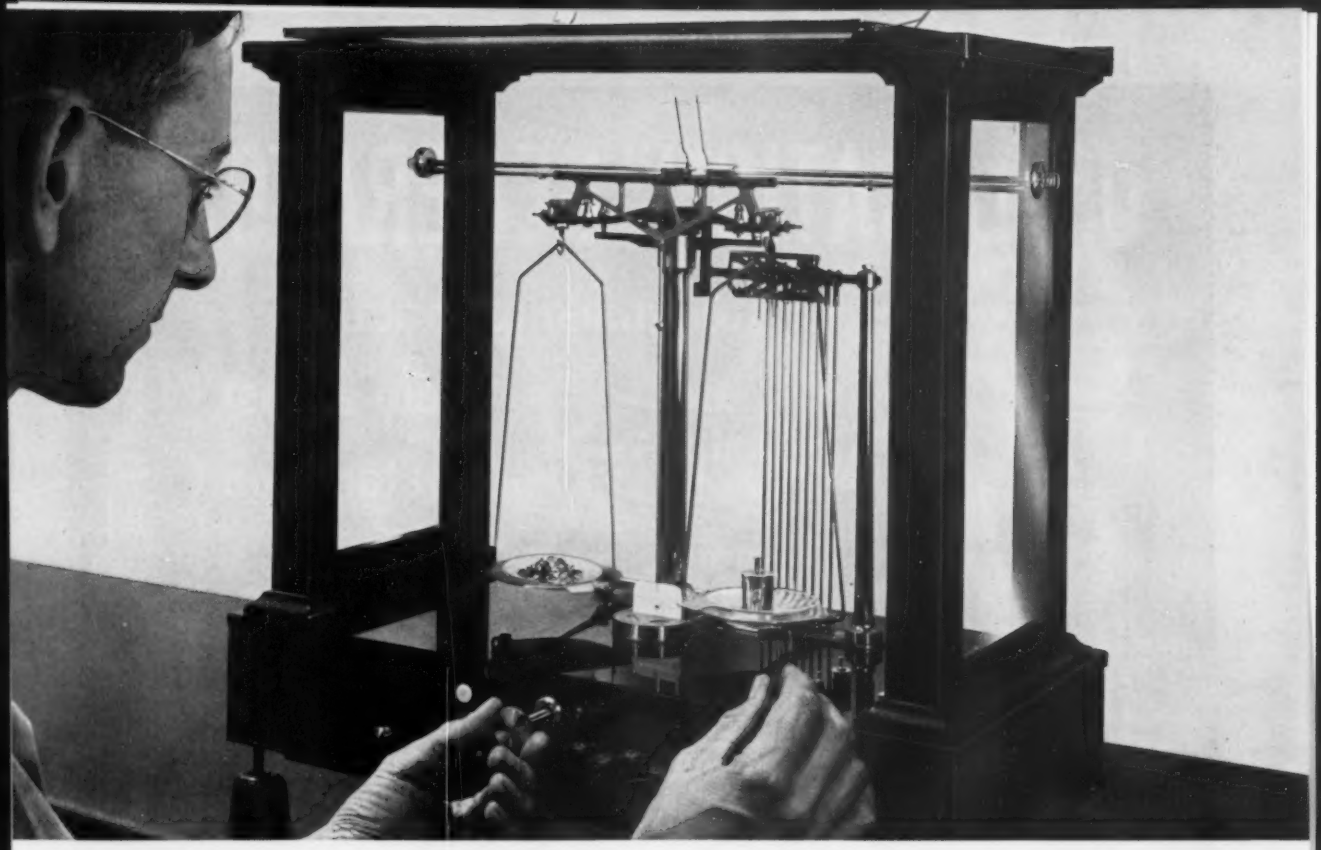
Automakers and Congress Reconvene

◆ COMPLAINTS from dealers in new and used cars are getting an airing in a new series of motor industry hearings held by a Senate group.

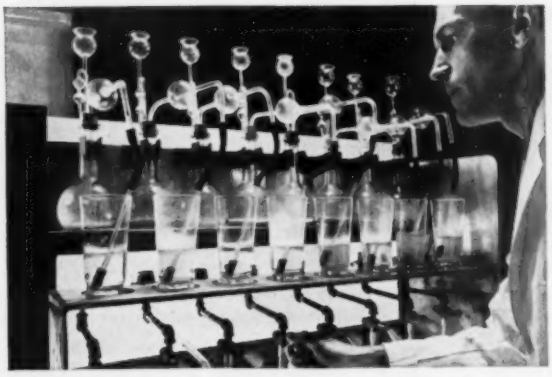
A Senate Commerce subcommittee with Sen. Monroney, D., Okla., as chairman is exploring auto purchase financing and such perennial questions as the extent of phantom freight and car bootlegging. First witness scheduled to appear on Jan. 19 is George Romney, president of American Motors Co.

It is expected that the full day will be required for Mr. Romney's testimony and for disclosure of the results of a subcommittee poll of dealers' views on their problems. In 1955, approximately 20,000 new car dealers replied to a questionnaire sent out by the Senate body.

There are to be gaps of days or even weeks between hearings. Following the appearance of Mr. Romney, there will be a recess while spokesmen from Studebaker-Packard, Chrysler, and any other motor firms which wish to be heard prepare their statements. Sessions will resume on dates set by the chairman.



How Great Lakes Steel *weighs* quality



IN A QUALITY CONTROL LABORATORY, chemical analyses such as these, are run on every heat. Then . . .

THE ANALYSES are telautographed immediately to the melter so he can add elements to meet customer's requirements.

How much does quality weigh? In the photograph above, a test sample is being weighed for chemical determinations. Tests like this give our open-hearth operators a running check on molten steel while it is still in the furnace; enable them to pour heat after heat of high and uniform quality.

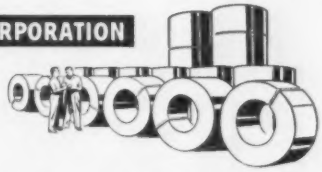
In every department at Great Lakes Steel, from raw material docks to delivery of finished steel, the emphasis is on quality—on seeing that customers receive steel that meets their particular requirements.

Do you have a manufacturing problem involving flat-rolled steel? A call to Great Lakes will make available to you the experience of our entire organization.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

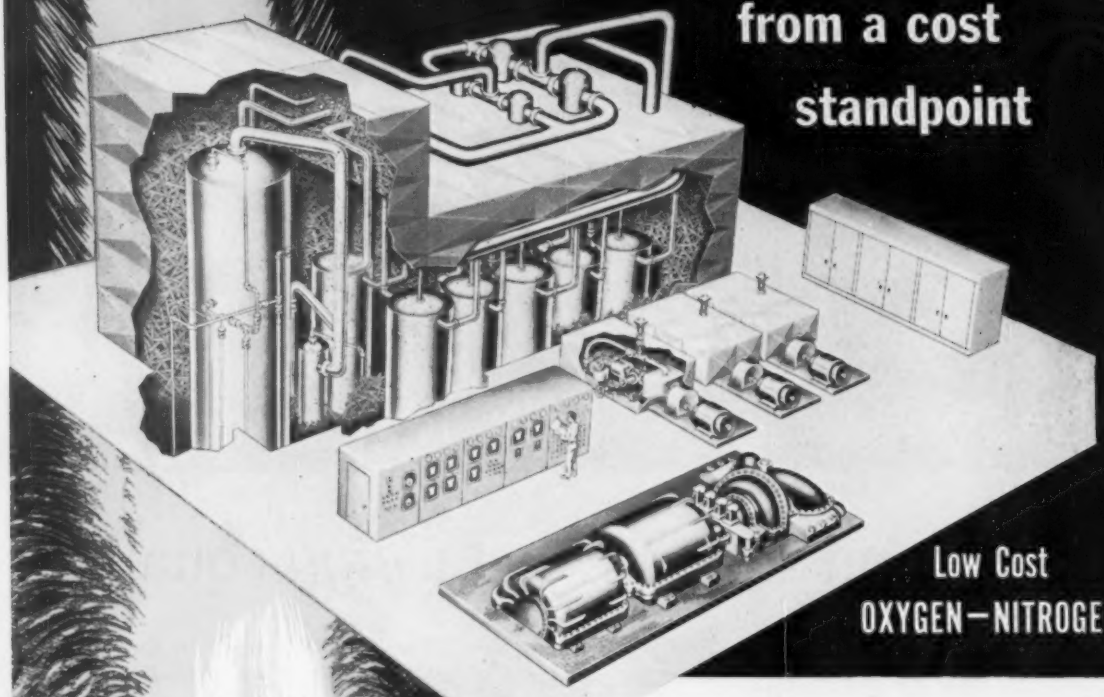
NATIONAL STEEL CORPORATION



District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

"ON-LOCATION" GENERATORS

make oxygen steel-making practical from a cost standpoint



One of the important new uses of oxygen in steel-making is its application in Top Blown Converters for the production of high quality steel at lower cost. This process is now being successfully employed here and abroad and holds a prominent position in the expansion plans of the industry.

For this and other large volume uses of oxygen in the steel industry, we are prepared to design and build "On-Location" Oxygen and/or Nitrogen Generators to fulfill your particular requirements on a lease basis—*without capital investment.*

We design and build:

Large Capacity Tonnage Generators, regardless of size, purity, high or low pressure cycle, with liquid oxygen pumps, if your oxygen should be under pressure

or

"Packaged" High Purity Generators, producing high purity oxygen and nitrogen simultaneously—oxygen delivered safely under pressure by Air Products patented liquid oxygen pumps.

Send us details regarding your requirements and we will give you actual figures on the savings you can expect with an "On-Location" Generator installed at your plant.

Air Products
INCORPORATED
Dept. I, Box 538, Allentown, Pa.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Jan. 14, 1956	158,160	26,136
Jan. 7, 1956	129,371	20,015
Jan. 15, 1955	161,165	23,197
Jan. 8, 1955	156,345	21,532

*Estimated Source: *Ward's Reports*

ciprocating, gas turbine and free piston.

Don't sell the reciprocating engine short. Past performance, costs and light weight still make it a contender in the engine field for many years to come. In addition, there is still room for a great many improvements in the engine.

The possibility of using fuel injection systems or superchargers, combined with higher compression ratios, indicates that the reciprocating engine may be used in automobiles for the next decade or even longer.

Turbine Bugs . . . Another reason that the present engine may be around for a long time is the problems involved in developing a suitable gas turbine.

Some of the disadvantages which engineers must contend with are heat, noise, and high fuel consumption.

This does not mean that gas turbines are not possible in the future, but their advantages and disadvantages over the present day engine make it appear improbable at the moment.

Its use will grow gradually once it is perfected. It may be first introduced on expensive automobiles and, as manufacturing costs justify it, it will be put on lower priced cars.

However, the gas turbine may still never completely replace the reciprocating engine unless such things as cost, service difficulties, repairs and maintenance are as easily handled as they are in the present engine.

Free Piston Problems . . . Nevertheless, most experts agree that the gas turbine will be the successor to the reciprocating engine, at least for the large, highway type car. Its built-in advantages such as providing its own automatic transmission make it the logical engine of the future.

The free piston engine is considered a remote possibility as far as powerplants of the future are concerned. Such problems as piston ring life, lubrication and cooling must be solved before it will be a contender with the present day engine and the gas turbine.

There is a possibility that the amount of horsepower contained in future engines might not go over 350 in the next decade.

Aluminum:

Use in radiator may be on the way.

The use of aluminum in cars has already reached the point where it is no longer considered a substitute for other materials but stands on its own merits.

This doesn't mean that there will be an all aluminum car produced in a matter of years, but that in certain cases the light metal is more suitable for manufacture and operation of a vehicle.

Use of the metal in 1956 cars has climbed to an average of 35.2 lb compared to 29.6 in 1955. It is estimated by the Aluminum Company of America that aluminum applications on autos will rise to 49.8 lb by 1960 and to 81 lb by 1965.

Used in Transmission

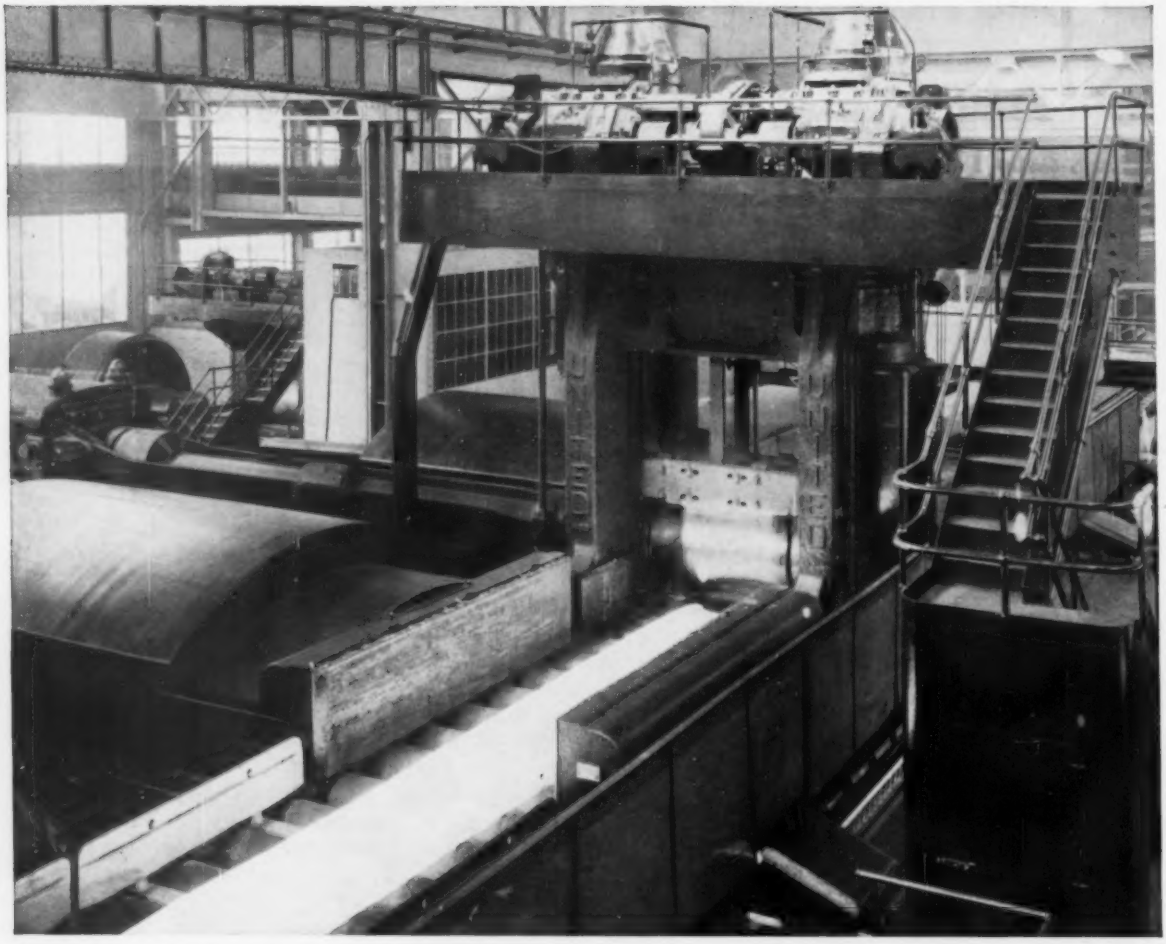
Nearly 50 pct of the metal used today goes into a car's automatic transmission. However, Alcoa believes that among the promising new applications for the metal are such things as brake drums, radiators, wiring and air conditioning units.

The newest development which will be introduced shortly is the aluminum-finned, brass-tube radiator, now in pilot production.

The latest use of aluminum this year is its application to exterior trim. Cadillac, DeSoto, Plymouth and Hudson are already using aluminum in this way and Alcoa says the time is not far off when all cars will have some form of the light metal in this manner.

THE BULL OF THE WOODS — **By J. R. Williams**

THEY'RE TESTIN' SOME NEW TOOL STEEL IN THEM SANDY HOLES-- THEY'VE GOT THEIR HEADS TOGETHER ON IT!
THAT'S THE ART OF LOOKIN' IMPORTANT-- I'D HATE TO TRY THREADIN' A NEEDLE AROUND HERE!
1-18
THE BARFLIES
J.R.WILLIAMS
© 1956 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.



Your gear drives need this extra protection

ENCLOSED gear drives for roll stands get extra protection when lubricated with *Texaco Meropa Lubricant*. Here's why:

Texaco Meropa Lubricant embodies extreme pressure properties that toughen its lubricating film to withstand shocks and heavy duty loads far in excess of severe operating requirements of gears and bearings. These EP properties are notably longer lasting than those of other lubricants.

Texaco Meropa Lubricant contains polar additives that give it exceptional adhesive properties — it clings to the gear teeth under the most adverse conditions.

In addition, *Texaco Meropa Lubricant* is noted for its ability to resist heat-induced thickening. It will not foam and will not separate in use, storage or centrifuging. It is non-corrosive to gears and bearings.

A Texaco Lubrication Engineer will gladly give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN: TEXACO STAR THEATER starring JIMMY DURANTE on TV Sat. nights. METROPOLITAN OPERA radio broadcasts Sat. afternoons.

Gov't Spending To Rise By $2 Billion

New expenditure programs will push total outlays to around $66 billion in fiscal '57 . . . Military, highways, health and foreign aid plans figure prominently . . . Prices will nudge upward—*By G. H. Baker.*

◆ GOVERNMENT SPENDING is to grow by a plump $2 billion in the new fiscal year. Outlays currently are running at the rate of about $64 billion, and the new spending programs now being considered by the Congress will easily push this total up close to (or even over) the $66 billion mark for fiscal 1957.

Here are just a few of the new spending programs being proposed by the Eisenhower Administration to a "hang-the-expense" Congress that has its mind on the coming elections.

★ Military spending for supplies, services, and payrolls to rise from $34.5 billion to close to $36 billion.

★ A bold new interstate highway program, estimated conservatively at an extra $1 billion annually with a total cost of at least $25 billion.

★ Substantial increase (about $23 million is being asked) in federal health and social security checks.

★ Foreign aid, if the State Department has its way, is to rise from $2.5 billion a year to about $5 billion a year.

What Does It mean? . . . All this points significantly to another mild round of inflation in the months ahead. It also means that there is virtually no chance of reducing the $280 billion national debt.

Prices will tend to nudge upward, as a result of this extra government spending. Union leaders, who follow price trends closely, can be expected to cite all inflationary trends when they present their new wage demands.

Air Power . . . U. S. air attack potential is to reach a new peak during 1958, when the number of Air Force B-52 heavy bombers in service is to total about 500.

As part of the B-52 procurement program, the Air Force has just placed with Boeing Airplane Co., Seattle, an order for $248 million worth of the 600-mph planes. This order will cover some 31 aircraft, if the unit cost of the B-52 is not reduced below the present $8 million.

Placement of the new contract, the Air Force says, does not mean there has been any new decision to buy greater numbers of the heavy bombers to counter Russian air threats. Instead, the action is called an additional commitment of funds along lines already set.

Current intercontinental striking force of the Strategic Air Command is composed of 11 wings of B-36 bombers. The slower B-36, however, is to be fully replaced by the B-52, which has a range of about 6000 miles and can fly greater distances when refueled.

Tax Reduction Possible . . . Don't write off the possibility of tax reduction this year. Despite President Eisenhower's warning to Congress against "premature" tax cuts, nearly every member of the Senate and House facing an election contest this year is privately determined to vote for reduction just as soon as the opportunity to do so arises. This goes for Republicans as well as Democrats.

A $100 increase in personal exemptions—boosting the allowance from $600 per person to $700—is the most favored type of reduction now being discussed. There's little or no hope, however, for pulling down the 52 pct rate on corporation income, or for softening the existing excise set-up.

Crime Doesn't Pay

■ **Ike's tax men figure 1955 was the government's best year for enforcing the tax laws.**

■ Criminal convictions in 1955 for tax evasion reached an all-time high, says the Department of Justice. Box score on the number of persons convicted for tax dodging in the past four years comes to:

1952	1953	1954	1955
(Truman)	(Ike)	(Ike)	(Ike)
377	493	542	909

■ Speed-up procedures and more lawyers spelled the difference, the Department points out. In addition, the sum involved in pending refund suits brought by taxpayers has been cut from $358 million to $327 million, thus saving the government a potential $5096 daily in interest. This year, tax collectors may make life tougher yet.

At Wendel Research & Mfg. Corp.

Shell Dromus Oil E increases tool life 60%, provides better cooling and increased production

Wendel Research & Mfg. Corp., Albertson, New York, encountered extremely short tool life when drilling A.I.S.I. 4140 steel used in the manufacture of pilot ejection seats. They also experienced broken bits, chip welding, discoloration and burning of the tools. Shell Dromus Oil E was recommended to combat these difficulties. Here are the results:

Dromus Oil E immediately ended Wendel's trouble. The drill and steel bar stock were very cool and easy to handle. Chip settling was excellent, and discoloration of tools and work was completely eliminated.

Here are some of the outstanding features of Dromus Oil E:

1. Excellent wetting and cooling properties—wets all metal surfaces extremely fast.
2. Provides longer tool life—better finish.
3. Not sticky or greasy—keeps tools and work exceptionally cool.
4. Forms a solution, not an emulsion . . . is stable in any concentration.
5. Easy to mix in hot or cold, hard or soft water.

Write for information on Shell Dromus Oil E. See how it can help you increase tool life.

SHELL OIL COMPANY
50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Services:

Gov't considers setting up pay-as-you-go fee plan.

The cost-conscious Eisenhower Administration is giving new thought to setting up all government services on a pay-as-you-go basis.

Fees for all types of activities now performed free, such as the issuance of many government pamphlets and the granting of licenses to radio and television operators, could bring in a very substantial sum to the U. S. Treasury. A combination of new fees and higher rates on services for which a charge already exists might result in income ranging upward from $70 million annually.

Isn't New Idea

Idea of putting the public services performed by federal agencies on a pay-as-you-use-them basis has been explored before under the Eisenhower Administration. In late 1953 and early 1954, the wheels began to turn in a drive to have the departments and regulatory bodies pay some of the costs of their upkeep.

The Budget Bureau directed that all agencies set up schedules of fees for such services as licensing and registration and for copying, certifying, and searching records. In quick compliance, the Federal Communications Commission, Interstate Commerce Commission, and Federal Power Commission issued fee schedules.

Early this year, the Senate Government Operations committee is expected to urge legislative action prescribing standards of fees for use by many agencies. Outcome of this proposal may be the eventual channeling of large sums from new sources into the nation's bank account.

Reach Legal Agreement

The Department of Justice reports that it has reached final agreement with the Cold Metal Process Co., Youngstown, O., over patent infringement claims raised by both parties.

The patent action was begun in World War II, and concerned the validity of patents for rolling steel used in war production.

The federal government, in two suits filed in Ohio, obtained the impounding of $4 million in royalties paid by licensees of Cold Metal.

Cold Metal and the Union National Bank, Youngstown, O., in three actions demanded $40 million compensation from the United States for patent infringement.

The claims are terminated, under a new settlement which has been approved by the courts.

The government's claims were based on World War II orders which eliminated all royalties from defense producers.

Plan Special Census

Information to help in the preparation of survival plans intended for use under atomic-attack conditions will be developed in a new U. S. Census Bureau study.

Backed by an estimated $90,000 from the Federal Civil Defense Administration, the bureau will make a four-city survey to work out formulas for estimating: (1) the increase of population totals and trends over 1950 census figures, and (2) the number of persons absent from their homes for work, school, or shopping during the day.

Resulting information would save the time and expense of conducting individual population studies in each survival-plan area.

Cities covered in this special project will be Houston, Milwaukee, St. Louis, and Washington.

Taxes:

Internal Revenue agents put on drive for back taxes.

Internal Revenue agents are conducting a bill-collecting drive across the nation in an effort to pick up an estimated $2 billion in unpaid back taxes.

The drive is not aimed at putting delinquent taxpayers in jail, but rather at getting the money due. Special tax agent staffs have been increased in field offices.

As part of the crackdown, the time has been shortened after the government sends a delinquent taxpayer a bill, and when a levy is clamped on business or private assets to force payment.

The drive follows a campaign last fall to collect a large amount of taxes employers had withheld from employees but failed to turn over to the government.

Disaster Tax Rules

Methods for deducting losses of business and non-business property damaged or destroyed by disasters such as last summer's floods and hurricanes are explained in a new booklet published by the Internal Revenue Service.

How the Federal Income Tax Applies to Losses From Hurricanes, Floods, and Other Disasters is available at all local IRS field offices, and from the main office, Washington 25, D. C.

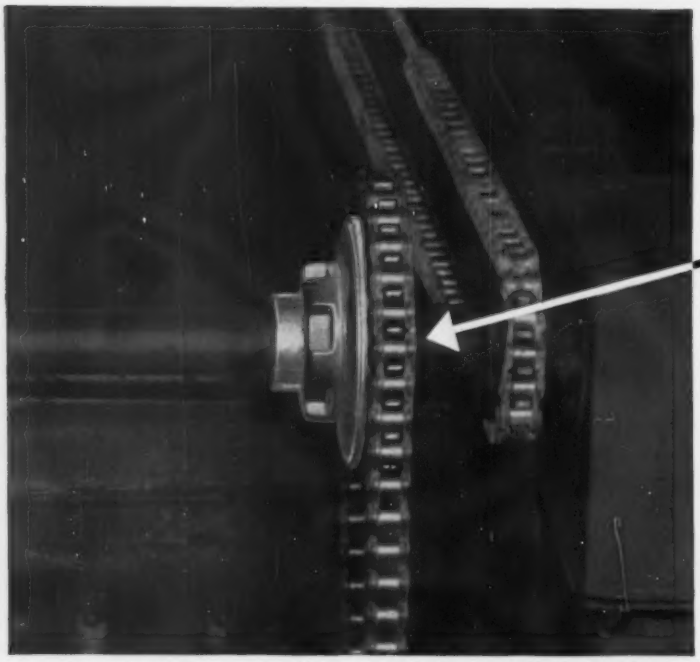
Where's the Traffic Money Trickling?

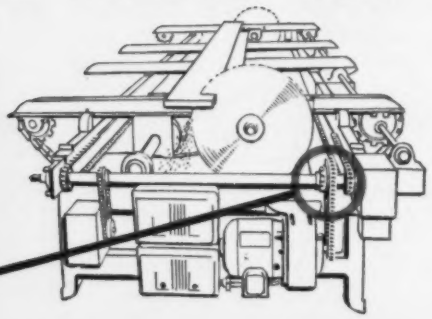
A large proportion of the more than $90 million a year paid by motorists into parking meters is being diverted by local government to nonparking uses, the American Automobile Assn. charges.

Present estimates of the AAA are that over 1.3 million parking meters are now in operation. Each meter produces an average of $70 a year. But well over half of these funds are going into general government revenues and being used for purposes other than parking, street improvement, or traffic control.

Less than 10 pct of the parking meter funds are being spent to provide offstreet parking facilities to bring about a permanent solution to the parking problem, the AAA calculates.

MORSE TORQUE LIMITER PROTECTS MOTOR AND REDUCER FROM DEAD-STOP OF DRIVEN UNIT!





Morse Torque Limiter and sprocket act as slip clutch on Model 55 Automatic Electric Shift Trimmer made by The Wheland Company, Chattanooga. Arbors are shifted at 120 fpm, instantly stopped and locked into place. Torque Limiter on jackshaft is set so sprocket slips when motor torque (38 ft.-lbs.) is exceeded. Absorbs inertia of 1-hp, 155-rpm gearmotor; reduces shock on drive unit when driven shaft is stopped.

Typical application shows how you can safeguard drive units and eliminate shear pins

Check these advantages of Morse Torque Limiters

- √ Eliminate downtime
- √ Torque-sensitive and fully adjustable
- √ Completely automatic and dependable
- √ Resume operation automatically
- √ Compact, standard sizes

In this Wheland Electric Shift Trimmer, two 200-pound saw arbors are automatically moved into position at 120 feet per minute . . . then stopped dead and locked into place.

The tremendous shock transmitted to the drive mechanism when the arbors are stopped, is safely dissipated by a Morse Torque Limiter used as a slip clutch between the driving and driven units. In addition, it prevents motor inertia from building up torque in the drive.

Versatile Morse Torque Limiters can safely control many of the shock-load problems present in your machine operations.

These simple devices are dependably sensitive and easily adjusted to desired torque limits. When overload or jam-up is cleared, they automatically resume operation, eliminating downtime or dismantling necessary with shear pins.

Send for Free Catalog

A full line of Torque Limiters is stocked by your Morse Distributor. For free catalog, or power transmission engineering help, see him or write today.

MORSE CHAIN COMPANY • INDUSTRIAL SALES DIVISION • ITHACA, N.Y.

MORSE

BW

CHAINS, CLUTCHES, AND COUPLINGS

Expanding Plants Offer Wide Markets

New and expanding Farwest metalworking plants offer wide-range markets for aggressive selling . . . Now's the time to map out this year's sales campaigns . . . Blueprint planning will pay off—By *R. R. Kay*

◆ THEY'RE OFF! Metalworking expansion derby on the West Coast is running at break-neck speed and on a fast track.

Sure winners: you sales executives whose salesmen start out the New Year with this hot tip sheet of new and expanding metalworking firms. They need your materials, equipment, services.

Here's the Farwest Lineup . . . Los Angeles: Lawler Tool and Die Co. Sunset Steel Treating Co. TelAutograph Corp., communications equipment. Fabriform Metal Products Div. of George Getz Corp., ferrous and non-ferrous metal brazing. Calbest Electronics Co. Foundry Div. of Gaines-Collins Co., makers of pipe threading and cutting machines. Wissmann Machine Shop. Microloc Corp., parts for weapons systems. Jaybee Mfg. Co., builders' hardware.

Grand Junction, Colo.: American Gilsonite Co., $10 million facility to produce gasoline and metallurgical coke.

Phoenix, Ariz.: Sperry Rand Corp., multi-million dollar electronics plant and laboratory.

Chula Vista, Calif.: Rohr Aircraft Corp., 150,000-sq-ft addition. Santa Clara, Calif., Pacific Western Industries, food processing machinery.

Oakland, Calif.: Atlas Screw Machine Products Co. Florence Metal Products, metal fabricating and welding. Electro-Capacitors Co. Payne-Mahoney, Inc., porcelain enameling plant. New Westminster, British Columbia, Beatty Bros., Ltd., washers, pumps.

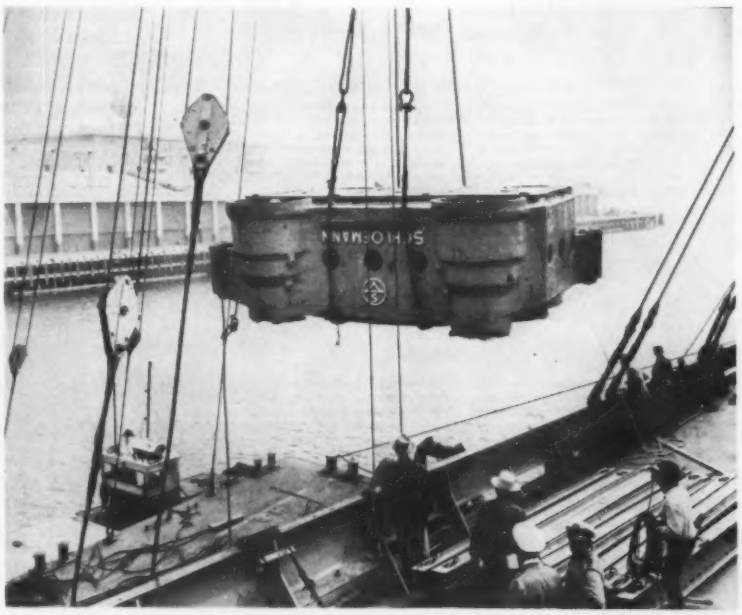
List Is Endless . . . El Segundo, Calif.: Tobey Aluminum Div. of Magnesium Co. of America, materials handling equipment. El Monte, Calif., Gregg Iron Foundry, cast iron casting. Pomona, Calif., H. W. Loud Machine Works, Inc., aircraft parts.

Santa Monica, Calif: Brown and Lail Co., gages and special tools. Harvick Mfg. Corp., materials handling equipment. Anachrome Corp., metal finishing.

Includes Northwest . . . Salem, Ore.: American Can Co., $1 million plant. Portland, Ore.: Garden Equipment Co. Matthews Refrigerator & Door Co. Gabriel Fabrication Co., steel fabrication. Interstate Brass Foundry. Trojan Automatic Machine Co., pipe forming machine. Mercer Steel Co., Inc., steel warehouse. Aircraft Div. of Screw Machine Products Co., aircraft maintenance equipment.

Huntington Park, Calif.: National Tool and Die Corp. Pacific Cut Washer Co. Compton, Calif., Cal-Air Engineering Inc., tools and dies. Laird, Inc., lubricating oils. Inglewood, Calif., Dayton Abrasives Products of California.

North Hollywood, Calif.: Structural Fabricated Steel Corp.



HYDRAULIC forging press, capacity up to 8000 tons, for Alcoa's Vernon, Calif. works arrived at Los Angeles Harbor in 88 sections. Newly engineered method of installation will make the press earthquake-proof.

Only Kearney & Trecker has Twin Screw Knee Support

Available under Tool-Lease program

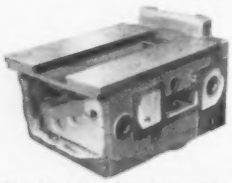
Now TF Series milling machines give you broad and equal distribution of all work loads ... prolonged economy at critical points ... unmatched rigidity under heavy cuts

KEARNEY & TRECKER'S new line of TF Series Plain, Universal and Vertical milling machines gives you a combination of more outstanding design and operating features (illustrated below) than any other knee type milling machine on the market today.

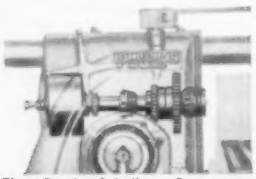
Among these features is the *exclusive* Kearney & Trecker TWIN SCREW KNEE SUPPORT design — the *double support* arrangement that distributes most effectively the weight of much larger, heavier knees, saddles and tables. This *balanced design* substantially increases stability under the heaviest loads ... offers greater resistance to torsional thrust under all cuts ... divides the wear factor in half thus assuring greater, longer-lasting accuracy.

The new TF Series line of production milling machines is available in five sizes — No. 2 to No. 6 from 10hp to 50hp. For complete specifications, and what these TF's can do for you, see your nearest Kearney & Trecker representative, or write direct to Kearney & Trecker Corp., Milwaukee 14, Wis.

5 more reasons why TF Series milling machines are way out front in rigidity

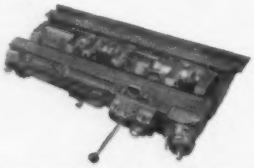


Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life, better finish and quieter operation.

Double "Vibra-Void" Overarms — Two solid steel bars, mounted completely through column, void vibration at source, afford more rigidity and resistance to deflection than any other type support. Design also greatly simplifies changing of arbors and cutters.



"Fron-Trol" Operating Convenience — Front-mounted controls include feed selection, Mono-Lever table feed and rapid traverse, automatic cycle table feed and rapid traverse controls, table handwheel, saddle clamping gib and backlash eliminator. Machines have 2" dia. table feed screw.

Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces. Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.

KEARNEY & TRECKER
MILWAUKEE

BUILDERS OF
PRECISION AND PRODUCTION MACHINE TOOLS SINCE 1898

KEARNEY & TRECKER CORP.
6792 W. National Avenue, Milwaukee 14, Wisconsin
Please send me Catalog No. TF-50 with details on new line of TF Series Plain, Universal and Vertical milling machines.

Name.....
Title.....
Company.....
Address.....
City.....Zone.....State.....

Does Pentagon Have Right Tooling Slant?

Tool builders and government differ on machine tool reserve policy . . . Industry has long memories of World War II and Korea . . . But new policy assumes short, final conflict—By *E. J. Egan, Jr.*

◆ WHAT'S YOUR guess if the U. S. should have to go to war again one of these days? Would it be a short affair, ended quickly with nuclear and other fantastically destructive weapons? Or would it settle down to a long, hard-fought contest, with tremendous waste in manpower and munitions?

These are important questions for those who know something about machine tools. Somehow, U. S. builders and those government officials responsible for defense planning just don't see eye to eye on the answers.

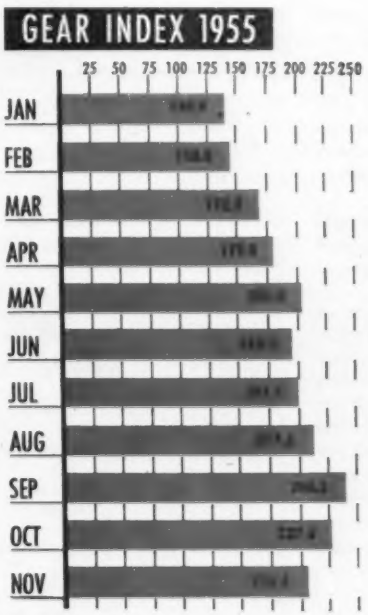
Builders advocate an up-to-date reserve of machine tools that would be available instantly in the event of a war emergency. Moreover, they think it should be large enough and diversified enough to cope with any increased demand for arms.

Pentagon Switches . . . Apparently, top brass in the Defense Dept. and Office of Defense Mobilization used to feel the same way. Until recently, that is. Now they seem to be shying away from the let's-be-ready-for-any-eventuality theory.

No one knows whether the Washington planners are extremely budget conscious or whether they have real inside information that the next war will be over in a hurry. Maybe it's a combination of both. Latest Defense Dept. decision is to bring tools now in reserve out of mothballs. They're to be fed into operating production lines if they'll do a better job on military orders than present tools.

This decision gives credence to the idea that military men are figuring on a short war, if one comes. And to strike for a quick, decisive victory, modern arms in being and in plentiful supply will be the best bet. A much better bet presumably than a lot of capacity for making weapons that might not be quite modern enough.

Bitter Memories . . . So if dipping into the emergency tool reserve does indicate short-war planning, is the planning based on fact or on educated guesswork? At least the builders have some real-life precedent for urging a complete, intact reserve of machinery, tagged and ready.



Base: 1947-49 = 100
Source: American Gear Manufacturers Assn.

Their memories are vivid about what happened in the last two big shooting scrapes, World II and the Korean episode. Prior to both of these events, the country was seriously short of metalworking equipment for full war production. And no one in Washington seemed to consider that an awful lot of machine tools might just be needed in a rush.

Costly Mistakes . . . When the guns started firing in earnest the picture changed in a hurry. Overnight, both times, builders were transformed from Washington nonentities to fairhaired boys. Both times, too, the machine tool men paid a stiff price in sleepless nights and ulcers for the privilege of becoming VIP's.

Naturally, builders aren't too anxious to be caught in another wartime jam-up. They'd much prefer to keep feeding a steady flow of tools into some clear-cut and comprehensive defense preparedness program, as long as there is time to get prepared.

Right now most builders don't need a business lift from military orders. Demand from civilian customers has them snowed under. But if they were asked to wade through a certain amount of military procurement red tape with the assurance that there would be firm orders at the end of the line, they say they'd be happy to do so.

American Gear Manufacturers' November index of business volume in the gearing industry is pegged at 210.4. This is a decrease of 7.5 pct from the 227.6 figure reported for October, 1955.

Look into REVERE Phosphor Bronze – it pays RAVENNA to use it!

This Moen Single Handle Mixing Faucet contains an anchor disc and an anchor washer, both stamped out of Revere Phosphor Bronze Strip. These are small parts, but in a fine product such as this faucet, high quality metals must be used throughout. Here is a condensation of the manufacturer's experience with the phosphor bronze:

Anchor Disc: • Standard punching speed maintained. • No pre-straightening off the arbor for the automatic punching process. • No excessive die wear. • Corners are sharp and clean; no de-burring needed. • Natural mill finish is better than they could achieve by tumbling or burnishing. • High tin content means no lubrication is required; they call it "silent brass."

Anchor Washer: • Have not had a single surface failure. • Dry tumble to de-burr. • Good fatigue characteristics and no obvious signs of corrosion.

Revere offers several types of phosphor bronze, each with slightly different characteristics. In addition to this alloy, Revere also supplies Ravenna with round and octagonal leaded brass tube and free-cutting brass rod, for use in various parts of the valve. We will be glad to collaborate with you on selection of just the right forms of the correct alloys for your products, present or projected. See the nearest Revere Sales Office.

Moen Single Handle Mixing Faucet, made by Moen Valve Co., Division of Ravenna Metal Products Corp., 6518 Ravenna Ave., Seattle 15, Wash.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

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Mills: Baltimore, Md.; Brooklyn, N. Y.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif., New Bedford, Mass., Newport, Ark.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

"The Revere Four-Way Service" is a 16 mm. sound motion picture in color, educational and informative. If you haven't seen it, write nearest Revere Office.

The Iron Age

SALUTES

Bryant W. Langston **Head of a machinery manufacturing concern, he has shown that original selling can identify a company with new customer thinking and pay off in steadily increasing business.**

Corrugated containers have been enjoying a distinct boom since World War II. New uses of containers for point-of-sale display have added to the surge. Corrugated material has gotten a big play for a wide range of shipping and storing functions.

One of the interesting things about the boom has been the heads-up reaction of The Samuel M. Langston Co., Camden, N. J. Makers of corrugated container machinery, the company was not content to just go along with the uptrend. President Bryant Langston came up with the idea of boosting sales by talking about container design instead of machine features. "Think first of corrugated" was his slogan for an advertising series that showed the latest wrinkles in container make-up.

The ads drew a very strong response. Langston sales, which were less than $2 million in 1945, jumped to over $10 million in 1954. Other factors enter into this growth but the company feels indirect selling has definitely helped it promote and share in a boom.

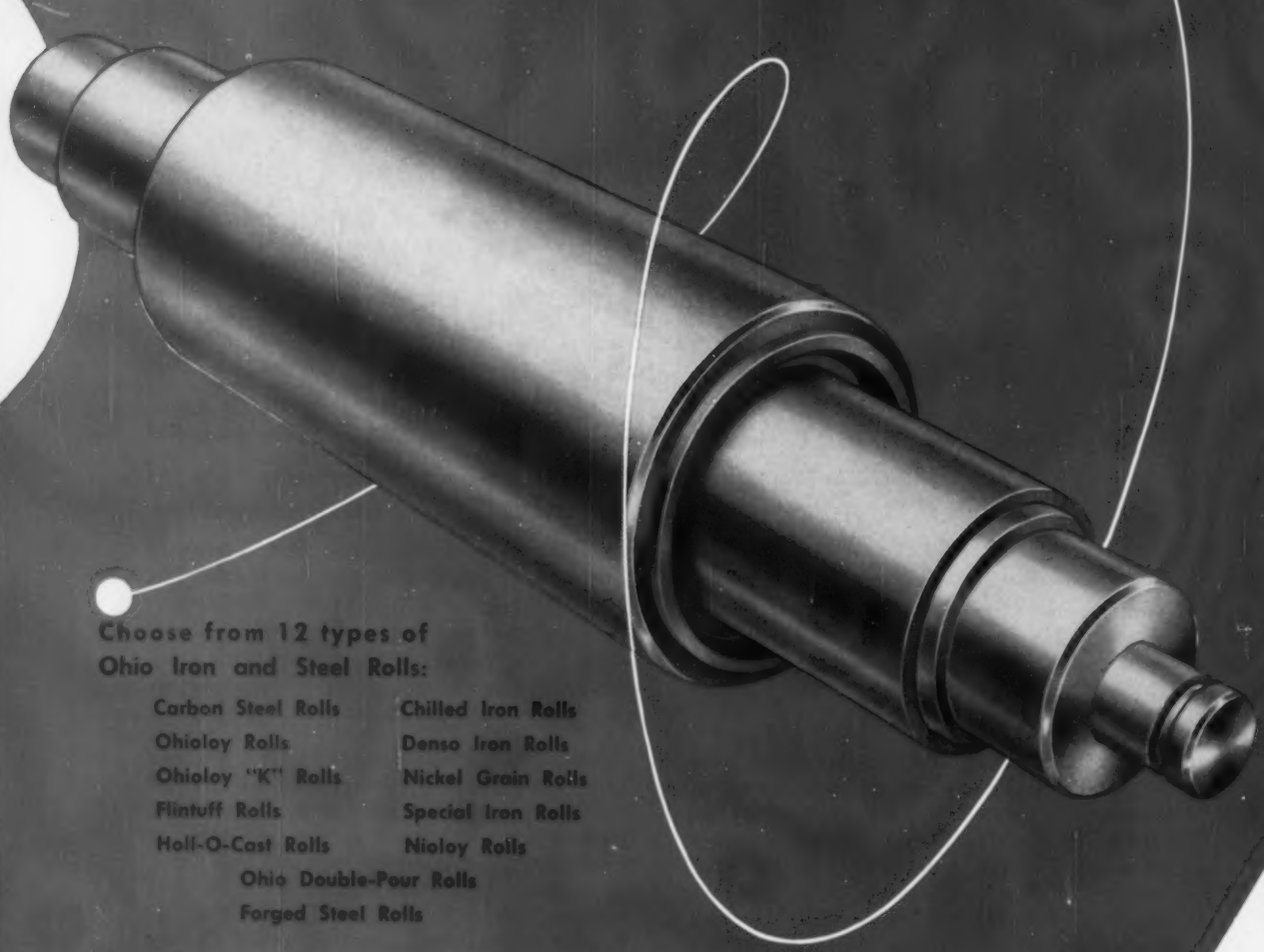
To meet demands of a growing market, Mr. Langston launched a $1,250,000 expansion program in 1953. The company added over 50,000 sq ft to the factory area. New machine tools, added office space, and extended licensing arrangements were part of the growth pattern.

Bryant Langston has headed the company since 1946. Before becoming president, he worked in the plant, gained experience as a member of the sales force and served as vice president. He is a soft-spoken man, widely read and well-versed in painting. At the same time, he is an alert practical thinker with definite ideas and an air of quiet determination. He has traveled all over the world, likes to tell of finding California oranges in a Brussels market, safe and sound in a corrugated container.

His outside interests have included work for the Cerebral Palsy campaign, the Community Chest and the South Jersey Medical Research Foundation. He is a director of the Camden Trust Co. and of the Farmers and Mechanics National Bank of Woodbury, N. J.

Ohio Rolls

shaping metal for all industry



Choose from 12 types of
Ohio Iron and Steel Rolls:

- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Flintuff Rolls
- Holl-O-Cast Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Ohio Double-Pour Rolls
- Forged Steel Rolls

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

Plants at Lima and Springfield, Ohio

ORI

The Iron Age INTRODUCES

A. G. Patterson, elected president, Electric Controller & Mfg. Div., **Square D Co.,** Cleveland; **Dr. John D. Leitch** and **Alvin C. Dyer,** elected vice presidents and directors, Electric Controller.

John G. Knowlton, elected president, **Bogue Electric of Canada, Ltd.,** Gloucester, Ontario.

Cecil W. Farrar, elected president, **Case Manufacturing Co.,** Buffalo.

F. H. Mulligan, elected president, **Charles Hardy, Inc.,** N. Y.

Austin Goodyear, elected executive vice president, **Hewitt-Robins Inc.,** Stamford, Conn.

Edmund M. Kowkabany, elected vice president, **Burns and Roe, Inc.,** N. Y.

Howard R. Swartz and **Frank L. Sonneman,** appointed assistants to the president, **Pittsburgh Screw and Bolt Corp.**

R. G. Altizer, appointed assistant to president, **Magnus Metal Corp.,** New York; **Ralph D. Baker,** named eastern sales manager; **Charles V. Kinsley,** named district sales manager, New York and New England.

Francis B. Speaker, appointed consultant, mining matters, Minerals Mobilization, **Hewitt-Robins, Inc.,** Stamford, Conn.

George W. Robinson, appointed assistant treasurer, **Sharon Steel Corp.,** Sharon, Pa.

R. L. DeWall, appointed executive assistant, accounting, National Tube Div., **U. S. Steel Corp.,** Pittsburgh, **John J. O'Neil,** named works auditor, National Works; **John F. Holt,** appointed assistant div. superintendent, Coke and Chemicals Div., Gary, Ind.; **Clinton L. Howe,** appointed district sales manager, Gerrard Steel Strapping Div., Englewood, N. J.; **Eugene B. Kovats,** named district sales manager, McKees Rocks, Pa.

Roger M. Wakeman, appointed assistant secretary and treasurer, **The Bullard Co.,** Bridgeport, Conn.

William K. Underhill, appointed sales manager, steel service plant, **Joseph T. Ryerson & Son, Inc.,** Wallingford, Conn.

Edward S. Maury, appointed general sales manager, **Marion Electrical Instrument Co.,** Manchester, N. H.

Richard S. Taylor, appointed sales manager, **Bethlehem Steel Co.,** Philadelphia; **W. F. Kuehne,** appointed contracting manager, Chicago.

Peter F. Casella, named manager, patent section, Research and Development Dept., **Hooker Electrochemical Co.,** Niagara Falls, N. Y.

W. SHERIDAN HUSS, elected president, Acme Steel Products Div., Acme Steel Co., Chicago.

A. STEWART MURRAY, elected president, Tyson Bearing Corp., Massillon, O.

JOHN W. TODD, JR., elected general manager, sales, Tenn. Coal & Iron Div., U. S. Steel Corp.

JOHN N. MILLER, appointed assistant to the president, Jessop Steel Co., Washington, Pa.

"...just common sense to use Tru-Steel!"

Right! There are 3 basic reasons why it's common sense to use Tru-Steel:

1. *Tru-Steel lasts longer.* Scientifically heat-treated, drawn to precise tolerances, it will not break into fines that cause wear of machine parts.
2. *Tru-Steel cleans fast.* Controlled chemistry and careful control checks give it the exact hardness required for fast, thorough cleaning.
3. *Tru-Steel costs less.* Yes, in sizes most popular for blast cleaning, Tru-Steel costs less than any other steel shot of comparable analysis and heat treatment.

Sold and recommended by Pangborn Corp., Hagerstown, Md.

STEEL SHOT PRODUCERS, INC.
BUTLER, PA.
Subsidiary of Pittsburgh Crushed Steel Co., Pittsburgh, Pa.

Charles H. Abbott, named sales manager, Door and Panel Div., **Atlas Plywood Corp.,** Boston; **Alfred M. Blakesley,** appointed sales manager, Container Div.

Joseph M. Dorocke, appointed sales manager, Engineering Works, **Kling Bros.,** Chicago.

William H. Baudouine, appointed sales manager, Abrasive Div., **Elgin National Watch Co.,** Elgin, Ill.

T. W. Fauntleroy, named general sales manager, **Pittsburgh-Des Moines Steel Co.,** Pittsburgh.

Thomas Pakenham, named general manager, Machine Tool, Heavy Machining, and Aircraft Divisions, **Portland Machine Tool Works, Inc.,** South Portland, Me.

Peter B. McSherry, Jr., appointed sales manager, Socket Screw Div., **The Bristol Co.,** Waterbury, Conn.

Robert R. Hendren, appointed general sales manager, **Hoeganaes Sponge Iron Corp.,** Riverton, N. J.

M. E. Swaim, appointed general manager, sales, **The National Supply Co.,** Pittsburgh; **Thomas B. Herndon,** named manager, oil field sales.

Donald L. Shirley, appointed sales manager, Pacific Northwest, **Link-Belt Co.,** Seattle, Wash.

Paul E. Kelly, appointed assistant manager, sales, Alloy Tube Div., **The Carpenter Steel Co.,** Union, N. J.

Herbert B. Nechemias, appointed manager, Electrical Div., **Wagner Electric Corp.,** St. Louis, Mo.

Raymond H. Whitney, named southeastern district manager, **Morse Chain Co.,** Charlotte, N. C

Harold Hoekelman, appointed assistant district manager, Chicago district, **The Youngstown Sheet and Tube Co.,** East Chicago.

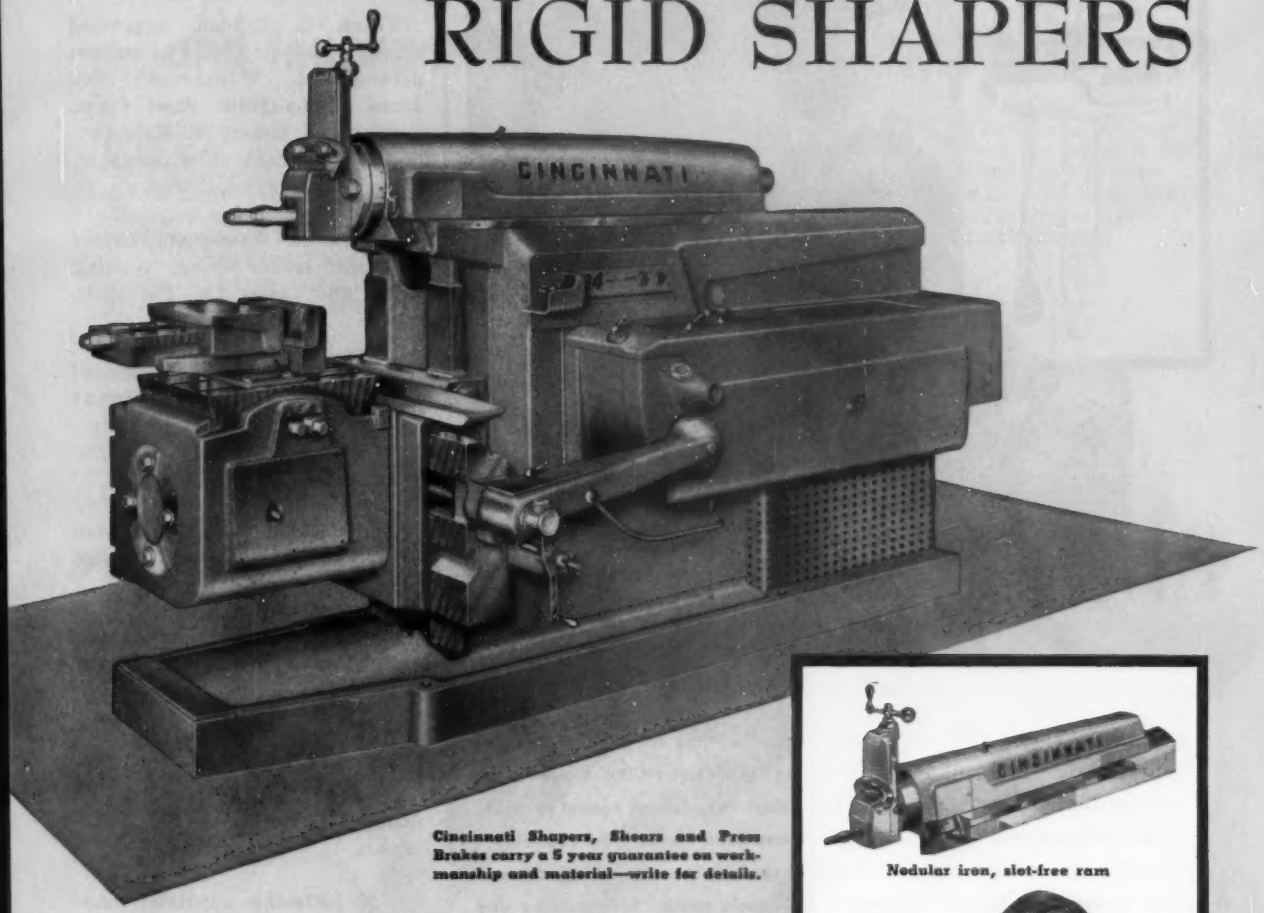
CLAUDE L. BORING, appointed general manager, Erie Foundry Co., Erie, Pa.

GORDON LEFEBVRE, appointed executive advisor, Clark Bros. Co., Olean, N. Y.

J. J. WALLACE, appointed vice president sales. Clemson Bros., Inc., Middletown, N. Y.

JOHN W. VANCE, named works manager, Henry Disston Div., H. K. Porter Co., Inc., Philadelphia.

CINCINNATI RIGID SHAPERS



Cincinnati Shapers, Shears and Press Brakes carry a 5 year guarantee on workmanship and material—write for details.

New—modern—these Rigid Shapers offer faster, more convenient controls, greater accuracy, greater dependability. The New nodular iron ram, trunnion and vise, and wide, heavily ribbed column give a new rigidity—increase accuracy in cutting.

The New slot-free ram also eliminates the manual clamping of ram adjustment—a time saving feature.

A speedy, dependable electro-magnetic brake and clutch insure a faster performance.

50 P.S.I. pressure lubrication, exclusive on Cincinnati Shapers, is a real insurance against wear and a guarantee of long trouble-free performance.

Write for the circular on the New Rigid Shapers.

Nodular iron, slot-free ram

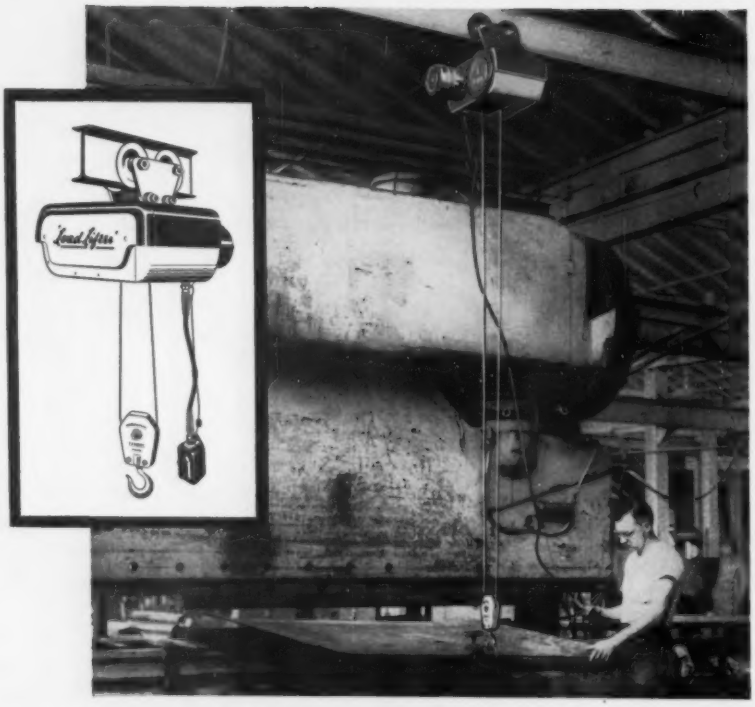
Electro-magnetic Clutch and Brake

The only shaper with 50 P.S.I. lubrication

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI



LIFTS 1/2-TON LOAD 30 FEET A MINUTE TO REDUCE COSTS

Fast load-handling brings big, permanent savings to many phases of production. The performance of the Series "600" 'Load Lifter' Electric Hoist is proving it in all kinds of plants every day! Push-button control provides quick lifting and lowering action. While one hand operates the control, the other is free to guide the load. Accurate spotting is easy. More loads can be handled per hour—and there's no muscle strain. Spur gearing and anti-friction bearings assure smooth functional perfection. From 24-volt protection at the push-button to synchronized motor and load brakes to non-fracturing hook, the Series "600" 'Load Lifter' has every safeguard for man, load and hoist.

If continuous, small load handling upsets your production schedules and increases operating costs, get acquainted with the tough, heavy-duty Series "600" 'Load Lifter' Electric Hoist. Learn how this powerful hoist increases your production time and saves money. Capacities: ½ and 1 ton. Lug, hook and push-type trolley suspensions available. Get details from your nearby "Shaw-Box" Distributor or write for Bulletin 408.

'Load Lifter'® ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' and 'American-Microsen' Industrial Instruments, and Aircraft Products.

PERSONNEL

Rex M. Bathurst, named plant manager, **Veeder-Root Inc.,** Altoona, Pa.

Frank G. Brydon, appointed manager, advertising and market development, Warehouse Div., **Jones & Laughlin Steel Corp.,** Pittsburgh; **Robert T. Rabe,** appointed assistant sales manager, Chicago warehouse district.

Adrian D. Thompson, named manager, jobber sales, **Nutting Truck and Caster Co.,** Faribault, Minn.

John W. Pozerychi, appointed plant manager, **International Packings Corp.,** Bristol, Conn.; **John W. Reedy,** named quality manager.

Fred M. Glassford, appointed manufacturing manager, **Dodge Div.,** Detroit.

Jerome N. Roberts, named assistant to manager, sales force, **Penn Metal Co., Inc.,** Los Angeles; **Robert C. Powell** will assist the manager of Philadelphia territory.

Frank E. Hurley, named traffic manager, **Foote Mineral Co.,** Philadelphia.

L. M. Littmann, appointed manager, New York office, Export Dept., **Allis-Chalmers Manufacturing Co.,** Milwaukee, Wis.

Austin L. Hawk, named manager, Western sales district, Chicago, **Raybestos-Manhattan, Inc.,** Passaic, N. J.

William S. Sprague, appointed sales representative, **Clemson Bros., Inc.,** Middletown, N. Y.

Robert E. Peterson, named district application engineer, **Clark Controller Co.,** Cleveland.

Robert L. Felt, appointed assistant chief metallurgist, **Crucible Steel Co.,** Midland, Pa.

William P. Weigand, appointed chief production engineer, **Wheeling Steel Corp.,** Benwood, W. Va.

Here's one reason why Michigan Tractor Shovels can move more yards per day, day after day...

USS MAN-TEN Steel provides extra strength and toughness in bucket and bucket boom

DESCRIBED AS "a bear for punishment and a hound for work" this big-yardage earth mover built by Clark Equipment Co., Construction Machinery Division, of Benton Harbor, Mich., is so engineered that every part contributes to high capacity operation and continuous, long-time service.

Use of USS MAN-TEN High Strength Steel in both bucket and bucket boom is typical of the care taken to ensure maximum durability and freedom from breakdown.

USS MAN-TEN Steel with a yield point of 50,000 psi—one and a half times that of ordinary carbon steel—readily provides the stamina needed to handle full buckets hour after hour. Its 40% higher fatigue strength safely absorbs shock and vibration when working the shovel into heavy, hard-to-dig material. Its greater abrasion resistance pays off in materially reducing bucket wear.

All these benefits inherent in USS MAN-TEN Steel combine to promote more dependable and more efficient shovel performance. They are obtained with no increase in weight, at little or no increase in cost.

TO HELP YOU—Our "Design Manual for High Strength Steels" contains comprehensive and practical information that you will find extremely useful in designing your product for greater efficiency and economy by the sound use of high strength steels. For your free copy, write on your company letterhead, giving title or department, to United States Steel Corporation, Room 5128, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Contact our nearest office and let us show you how you can apply USS MAN-TEN or our other High Strength Steels—USS COR-TEN and USS TRI-TEN—in place of carbon steel, to make your equipment *better*—able to do more work—able to last longer—with fewer stops for service and maintenance.

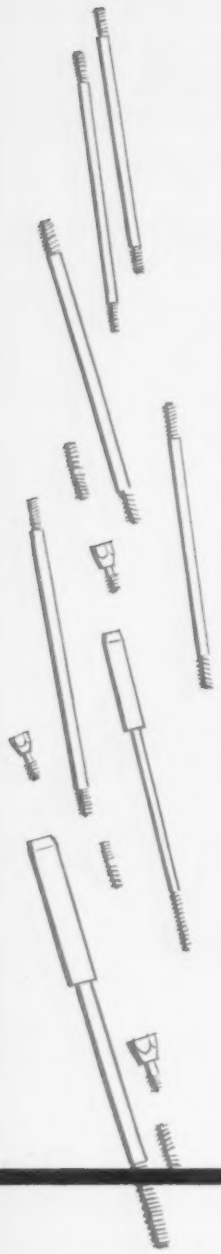
UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS MAN-TEN High Strength STEEL

USS

6-296

UNITED STATES STEEL



STANOIL *Industrial Oil delivers on tough assignment at Indianapolis Screw Products Corp.*

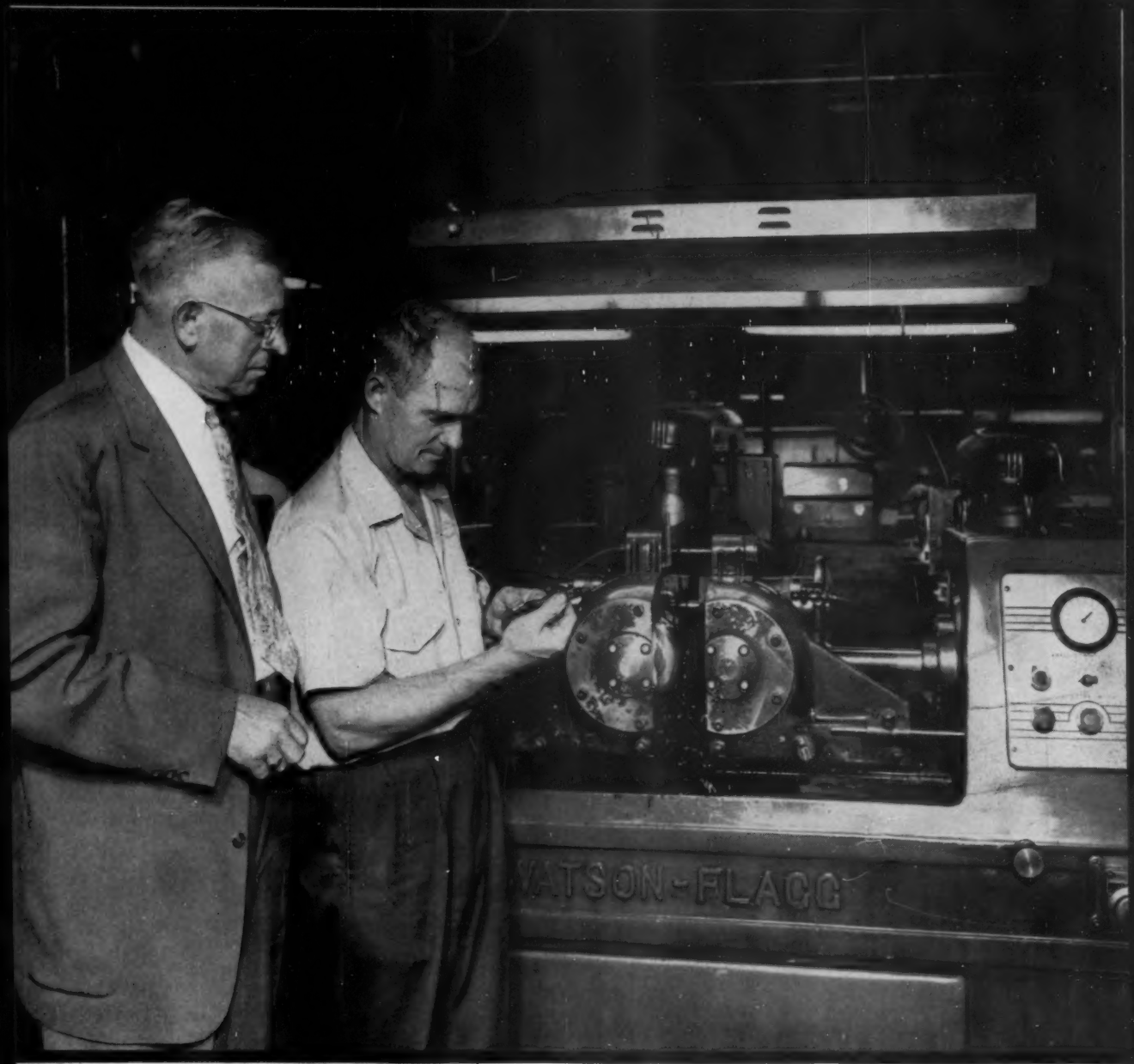
Rolling threads on aluminum bronze with pitch diameter tolerances as close as .0014" is a tough job but Indianapolis Screw Products Corporation is used to taking on such jobs and delivering. They give tough jobs to the hydraulic oil they use, too, and they expect it to deliver. They've given such a job to STANOIL and they're getting the results they expect—and more.

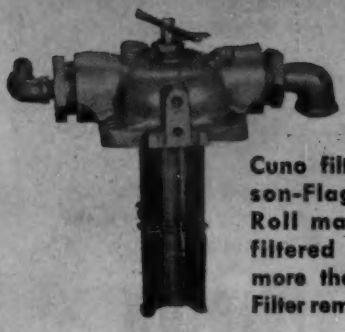
STANOIL Industrial Oil is used in the hydraulic system of a Watson-Flagg precision thread roller in the Indianapolis Screw Products Corporation plant. The system uses a Vickers pump and Cuno filter. The filter has not been cleaned in over a year *because it hasn't needed cleaning.* Here, as in other applications, STANOIL delivers top performance with minimum maintenance and maximum system cleanliness.

STANOIL likes tough assignments like this one; likes them because it can deliver with plenty to spare.

Perhaps you would like to know about the use of STANOIL in a hydraulic application in your plant. In the Midwest and Rocky Mountain states, a lubrication specialist at your nearby Standard Oil office will be happy to discuss it with you. Call him. Or, if you would like, contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Tight gaskets, good maintenance, and STANOIL add up to first rate performance at Indianapolis Screw Products Corporation. This shot of Vickers pump shows how good housekeeping and STANOIL team for top operation on tough assignment.





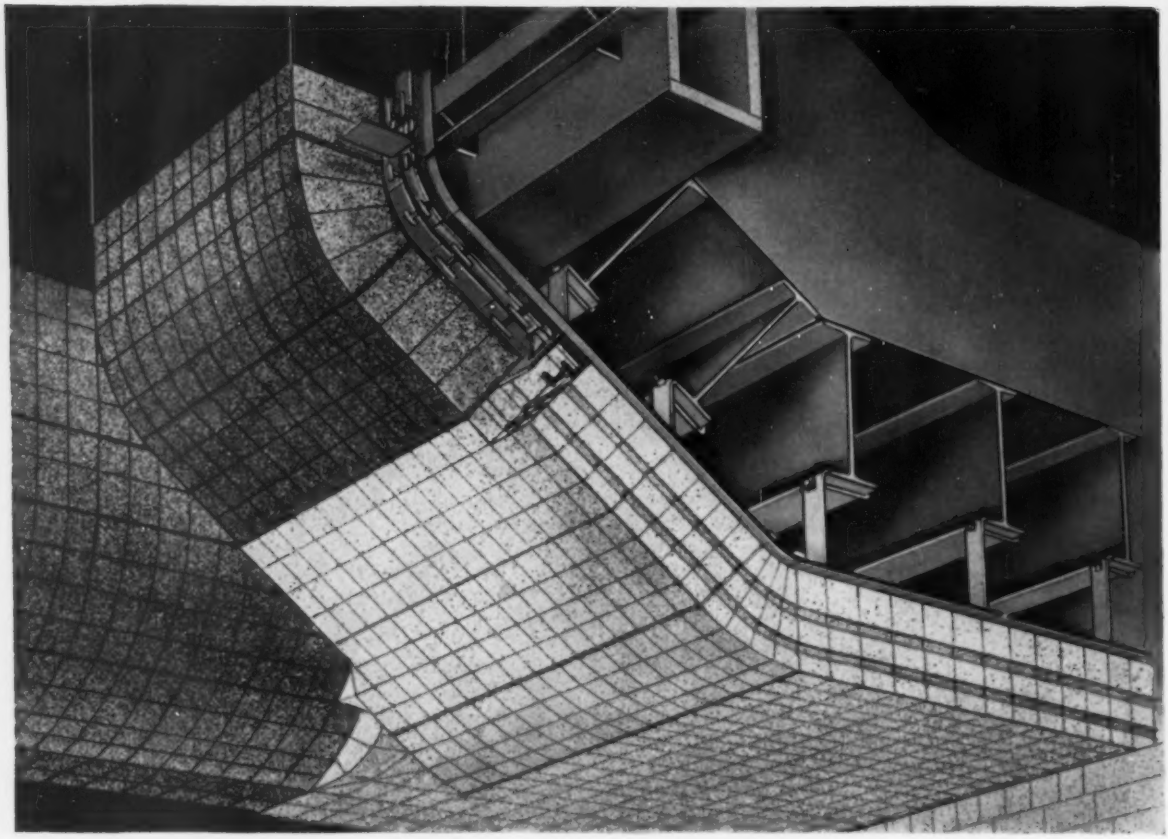
Cuno filter in Watson-Flagg Thread Roll machine has filtered STANOIL more than a year. Filter remains clean.

Mr. R. W. Williams, Plant Superintendent, checks pitch diameter of thread with Glenn Riggs, Standard lubrication specialist. Glenn Riggs is an old hand at helping industrial firms work out lubrication problems. Glenn has been doing this sort of thing for 28 of the 30 years he's been with Standard. This background and experience, customers have found, pay off *for them.*

STANDARD OIL COMPANY
(Indiana)

STANDARD

New trends in the use of refractories



LACLEDE-CHRISTY develops new arch for metallurgical furnaces

This new furnace arch design saves installation time, saves money and features adaptability never before achieved with refractory arch construction.

The Laclede interchangeable type arch proved its money and time-saving value by more than one year heavy duty steel mill service. Service records show from 850 to 1000-heat campaigns. It is particularly suited for fantail and chill arches in open hearth furnaces, and heating zone arches in reheating furnaces as well as copper reverberatory furnace arches.

Basic tile or clay tile may be hung interchangeably on the supporting structure, as service experience requires. The design permits adequate expansion of tile during heating up and continued furnace service. Minimum number of tile shapes are required.

Lug castings engage the tile on the bed joints, allowing easy installation. Heavy shelf castings prevent cumulative overload.

Money-saving performance can be expected when this interchangeable type arch is built with Laclede's Peerlac refractory (60% alumina) in 12 in. and 15 in. depths, and with basic refractory steel encased. Supporting structure of steel weldments and small heat-resisting castings are also available for prompt shipment.

This example of Laclede advancements in refractory service demonstrates one more point: it pays to make Laclede-Christy your first refractory source.

LACLEDE-CHRISTY COMPANY DIVISION

LACLEDE-CHRISTY COMPANY — FOUNDED 1844 — Quality First

HKP — H. K. PORTER COMPANY, INC.

H. K. PORTER COMPANY, INC.
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Mission 7-2400

FEATURE ARTICLES

How Does A Contract Stamper Choose A Press?

◆ Customers nag the job shop stamper around the clock . . . And they gage his value as a supplier by the speed of his response to such demands as, "Pull this job and start that one," or "Let's step it up on order number so-and-so."

◆ Just what kind of equipment is needed to run a contract stamping plant efficiently? . . . Here's how one shop operator evaluates such things as press versatility, auxiliary equipment, sturdiness vs. speed, and replacement formulas.

By C. C. CADITZ, President, Northern Metal Products Co., Franklin Park, Ill.

◆ I CAN RECALL—but I really prefer not to—any number of articles dealing with the selection of new plant equipment and the replacement of old machines. Such articles are judiciously—but liberally—sprinkled with all sorts of complicated equations and tables.

They leave you with the impression that you are producing parts on obsolete equipment, and that there is something reprehensible—if not exactly criminal—in making money that way.

My approach to the subject is not such an objective nor academic one. Some people may not even regard it as an approach.

I think, first, we ought to understand the varied nature of the contract stamping business.

Within the species called Contract Stamper there are many varieties. Each variety conforms to the special needs and requirements of the major industry it serves.

One variety specializes in miniature high production stamping. The equipment is generally small, fast and automatically fed. Another variety specializes in large, deep drawn parts. Its presses are large—with tonnage factors in four figures. Here you will find many double acting presses and hydraulics.

Some other varieties become so specialized as to almost lose their identity as contract stamping shops. For instance, suppliers of motor laminations. Their presses, with extremely short strokes, are almost single purpose machines.

The garden variety of stamper—by far the

From the Builder's Viewpoint

When you finish this article we suggest that you review the article titled "So You're Going to Buy a Press?" which began on page 71 of The Iron Age for December 22, 1955. Bear in mind that Mr. Caditz' article is from a press user's point of view, and that the one last month was written by a press builder. We're not going to tell you if the two viewpoints agree or disagree. You'll have more fun finding out for yourself, especially if you're thinking of buying a new press.

largest in point of number—has conventional mechanical presses — either straight side or open back inclinable types. Generally, he will concentrate on small presses—up to 65 tons—and/or medium sized press equipment—up to 200 tons. Some specialize in rather large press equipment in the 300 to 1000-ton range.

The reason for these groupings is that no press is an island unto itself. It needs other presses to supplement it. It also takes auxiliary equipment to keep the press going.

To make a metal stamping requires a lot more than a punch press. A stamping plant needs die maintenance, die storage, and die handling equipment. A stamping plant needs material handling facilities in the form of cranes, material storage areas, lift-trucks and tote boxes. A stamping plant needs shears and welders and degreasers and all sorts of other equipment. It is the limitations of all these machines which generally dictate the size range of press equipment.

There is one characteristic, however, which covers all of the varieties in the contract stamper species. It is the fact that no contract stamper controls his own production destinies. What he is going to make—and to a large extent when he is going to make it—are determined for him by others.

These "others" are the contract stamper's customers—none of whom seem to have heard of that handy gadget called a calendar. They refrain from using dates on their purchase orders; instead they just use words like "At Once" or "Rush."

This characteristic of the business underlies and influences every decision on press selection or replacement. So that we can refer to the factor conveniently, we'll give it a name. Let's call it NAGABILITY. The Nagability quotient of a contract stamper is what makes him a valuable supplier.

Jobs change daily

When a customer buys a stamping he is buying: "The right part—at the right time—in the right quantity—at the lowest price."

The factors of cost or quality are no more—or less—important than the factor of delivery. A job stamper must synchronize his men and machines and material to meet all of these daily changing requirements.

That high level of Nagability puts a premium on flexibility in machines as against a high possible number of pieces per minute—mechanically. You can tell an expediter your set-up time is longer than his lead time—but you can't tell it to him often.

There's a saying I once heard in the quiet of a stilled press, as the die setters removed a wonderfully complex die. It sounded somethink like, "1500 pieces an hour—3000 pieces a day—5000 pieces a week." A job shop is an eternal battleground between the lowest theoretical production costs and practical production problems.

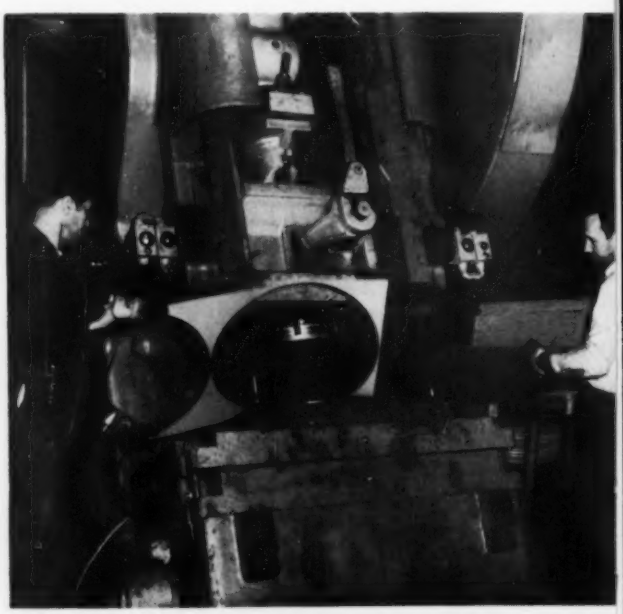
Today we are bewitched and bewildered by this thing called automation. Automation is to industry what Davy Crockett is to our younger set. Just as the magic of the Davy Crockett label can move mountains of merchandise, so can the word "automation" sell ideas in the field of plant equipment. But better methods are not always synonymous with automation in its glamourized state. (If this be heresy, I would like it to be remembered that I am kind to my mother.)

Automation ruled out

When I speak of automation, I speak of the glamorous type—the transfer press where the machine and the tools are built as a unit; where the parts are untouched by human hands and flow out in staggering numbers.

If a part warrants that kind of an approach and equipment investment, it doesn't wind up in a job shop. The company that controls the production has to be responsible for the investment. And as I pointed out before, that company is not the contract stamper.

I would like to point out here, too, that this is entirely a matter of economics—not of location. It would be equally foolish to put in such automation—if it were unjustified—in an end product manufacturer's plant. However, it can often be done in a captive operation without fatal results.



STURDY, versatile presses permit the contract stamper to meet ever-changing requirements.

But in a contract stamping plant equipment occupies the center of the stage. It is one of the determining factors in satisfying customer demands. Equipment must justify itself 365 days a year, less some Sundays and holidays.

Because of the nature of its business, a contract metal fabricating shop is unable to use even its conventional machines to anywhere near the point of highest efficiency.

Flexibility is, therefore, an important consideration in press selection in a job stamping plant. Stroke, shut height, tonnage, bed areas —all are scanned from the viewpoint of this happy medium: How large a variety of jobs can they do within the framework of the overall plant operation and still be reasonably efficient?

Despite, or perhaps because of, the fact that he cannot automate to achieve the lowest possible production costs, the contract stamper must give constant attention to his efficiency of operation — although everything he does must take into consideration his Nagability quotient. His decisions on press selection, therefore, are based on the minimizing of material handling and the lowering of hourly press rates.

Stampers who have been using standard 100 and 150 ton presses are now buying standard presses with greater tonnage and larger bed areas, so that several operations can be made on the same press. This, of course, cuts down on handling and indirect labor. In addition, the press increases the range of operations, inasmuch as a single larger part can be handled. However, we can't overlook the limitations of auxiliary equipment in this regard, also.

There is also a growing tendency in contract stamping plants to use press brakes as punch presses. These brakes are built with wide-flanged bed areas and variable speed clutches and, in some cases, with air cushions. In such a machine the stamper can put a variety of punch press dies and thus have several operators and operations working at one time.

Time is vital

Set-up time on a machine is of vital importance in a contract stamping shop. It is usual for a press to run several jobs in a day. This is not only due to short run orders, but to the high Nagability factor which will see a stamper pulling dies on large quantity runs so as to utilize the presses—or material available—to meet the requirements of other customers. A contract stamper usually finds it better to buy presses with air type clutches, which allow inching, plus one man set-up.

Availability of equipment is another important consideration when the Nagability quotient is high. A press is not available when it is down for repairs. There is always the thought, therefore, to buy presses from a local manufacturer or one with a local parts depot.

Management in a contract stamping plant will always mention the desirability of having all the presses of one make. This, of course, would allow a practical approach to keeping spare parts and minimizing down-time on repairs. However, this can't be too potent an argument, because on numerous trips the only plants I saw that didn't have at least a half dozen different makes of presses were those that didn't have six machines.

A job stamper finds that only a sturdy press will be able to stand the gaff of contract stamping work. For this reason, he looks at the clutch, bearings and crankshaft very closely.

In a stamping plant, presses are more often replaced for reasons of high maintenance costs and excessive down time than for obsolescence. Presses, generally, are hardy creatures, and I would venture to say that there are not too many stamping shops where all the press operators are older than the presses.

I don't believe that stampers give too much thought to obsolescence on their punch presses. They are much more conscious of this factor on their tool room and auxiliary equipment.

There is a definite pattern to press buying in the contract stamping field even though few metal fabricators purchase equipment against a budget, or formally analyze and weigh the various factors involved in their decisions. The problem is handled very much like romance—it gets done satisfactorily without too much help from reference material.

What About the Stamping Buyer?

". . . For them a good stamper keeps a night shift going even when there aren't enough orders on his block to run the week out. A customer has the right to place an order and have the stamper start on it; then hold it up for a change; release it again; then suddenly cancel it out—and all this as a matter of course. Beyond the question of a doubt, this is what the Founding Fathers were thinking of when they wrote the words 'inalienable rights' in the year 1776."

Some tips on Carilloy—

How To Get Better Welds In A Weldable Steel

By H. S. DAVIS, Process Representative, Air Reduction Sales Co., New York City

◆ Carilloy, a low carbon quenched and tempered constructional alloy plate steel, is characterized by very high yield strength and toughness, ready response to fabrication and welding . . . Here are some suggestions for capitalizing more fully on its good welding qualities.

◆ Tests show that welding does not affect tensile properties, improves hardness, toughness . . . Of various joint designs tried, single V with 50° included angle and 3/16 in. land proved best . . . Wire of 3/32 in. diam proved most economical.

◆ GETTING good welds starts with good base plate composition. But this in itself gives no assurance of welds with superior properties. Use of proper techniques, filler rod materials, pre- and post-treatments and choice of process can provide the extra bonus leading to joints of exceptional quality. Such is the case with Carilloy steel.

Carilloy is a low carbon quenched and tempered constructional alloy plate steel. It was developed to meet the need for a steel, primarily in plate form, possessing yield strength of 90,000 psi or more and sufficient toughness to stand up under unusual stresses and pressures as well as slack at either low or high temperatures. Its carefully chosen alloying elements make it an all-purpose steel. With proper heat treatment, it responds well to fabrication and welding.

Typical chemical composition is: 0.15 C, 0.75 Mn, 0.026 P, 0.030 S, 0.24 Si, 0.85 Ni, 0.50 Cr, 0.45 Mo, 0.05 V, 0.31 Cu, and 0.0029 B.

It can be furnished to the following heat-treated mechanical properties:

Thickness, in.	¼ to 2	2 to 4
Yield strength, psi	90,000	105,000
Tensile strength, psi	105,000	105,000
Elong. in 2 in., pct	18	17
Reduction of area, pct	55	50

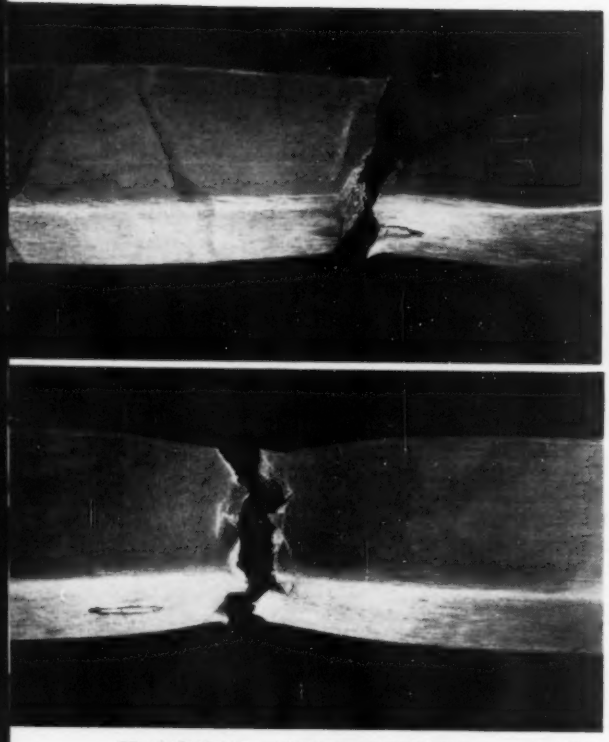
Heat treatment of Carilloy steel consists of water quenching from 1650°F and tempering at 1150° to 1200°F.

To meet the mechanical properties of this steel when using the inert-gas-shielded metal arc or Aircomatic process, a low alloy steel wire (A632) was designed for the ferritic welding of homogeneous rolled and for cast armor. This wire should be used in "arc-welded structures." It meets military specifications M16-986A (ships), and MIL-230-15 Grade 2. Typical composition is 0.08 C, 1.22 Mn, 0.50 Si, 0.014 P, 0.023 S, 1.30 Ni, 0.48 Mo, 0.14 V, 0.10 Cr.

Here are the average mechanical data:

Ultimate strength	115,000 psi
Yield strength (0.2 pct offset)	100,000 psi
Elongation in 2 in.	15 pct
Reduction of area	40 pct
Charpy impact strength	
0°F (keyhole)	40
−40°F (vee notch)	25 to 50

In welding Carilloy steel plate that must be heat-treated, type A608 Aircomatic wire is recommended. Typical composition of this wire is 0.08 C, 1.15 Mn, 0.40 Si, 0.022 P, 0.020 S, 1.15 Ni, 0.12 Cr, 0.40 Mo, 0.17 V.



TRANSVERSE TENSILE SPECIMENS of Carilloy T-1 steel show, top, failure one inch beyond weld metal zone on stringer bead joint; ductile failure on prime plate, bottom.

A608 wire is not standard. The physical properties that can be expected from it are:

	As-welded	*Drawn 1225°F, Air Cooled*
Ultimate strength, psi	116-120,000	105,000
Yield strength, psi	92- 98,000	85,000
Elongation, pct	7-11	20
Reduction of area, pct	11-22	50
Charpy Impact (Vee notch)		
−40°F, ft-lb	11-13	42

When welding Carilloy steel with electrodes, a low-hydrogen coated electrode is recommended. Such electrodes permit welding without preheating, with no chance of underhead cracking. Where 100 pct joint efficiency is needed and there is to be no stress relieving, AWS 12015 Airco 353 electrodes are recommended. Where stress relieving is necessary, use of AWS 10016 Airco 394 electrodes will eliminate embrittlement.

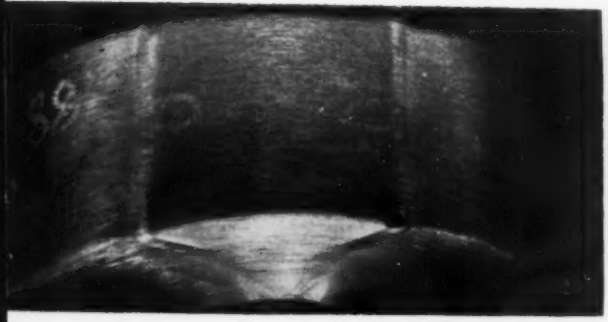
Stress relieving of weldments made of Carilloy steel is not generally considered necessary, since such weldments are tough in the as-welded condition. Stress relieving may be necessary under certain conditions where stress corrosion is involved or when there is a required dimensional stability during machining. Stress relieving temperatures should not exceed 1150°F.

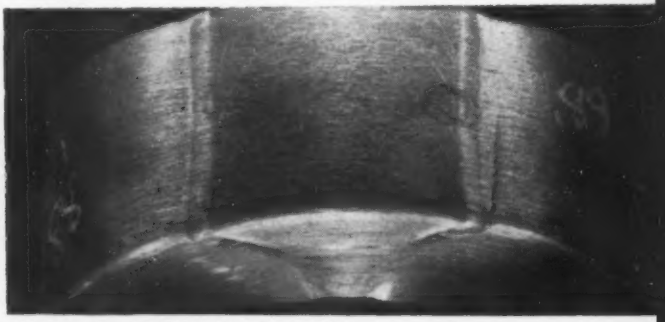
Full wear deposits sounder

Weld metal porosity can be affected by the welding technique, wire surface condition, and welding current. Full wear deposits tend to be sounder than stringer head deposits. In stringer head welding, higher travel speeds have caused more porosity than low speeds. Very high and very low welding current cause increased porosity. Argon and helium deposits tend to give more porosity than argon plus 1 pct oxygen deposits. Probably this is due to increased wetting and improved transfer caused by the oxygen addition.

Original tests on inert-gas-shielded metal arc were started using 1/16 in. A632 wire with Argon plus 1 pct oxygen as a gas shield. However, it was found that the deep point in the middle of the head was where gas was being trapped.

To eliminate this, 3/32 in. wire was tried with lower current densities. All during the trials physicals were excellent with low temperature impacts at −100°F. The 3/32 in. wire produced more economical results. Various joint designs were tried. The best proved to be a single V with 50° included angle and a 3/16 in. land. The first pass was put in with a stick electrode.





FREE BEND SPECIMENS show satisfactory stringer bead joint, left; crack appearing beyond weld metal zone on full weave joint, above.

Contents stay dry—

Seal Riveted Trailers Against Submersion

◆ It's always possible that a trailer carrying expensive military radar equipment might have to ford a river . . . Certainly it will be exposed to all types of weather, including heavy rains.

◆ To completely waterproof the riveted aluminum trailers they build, Thompson Trailer Corp. uses a variety of sealer materials . . . Application is simple and all joints and seams are thoroughly protected.

◆ CAREFULLY chosen sealer materials effectively waterproof all joints in the riveted aluminum trailers built by Thompson Trailer Corp., Pikesville, Md., to transport military radar equipment. A typical sealed trailer, minus the weight of radar gear, will actually float in water.

Trailer bodies are fabricated of aluminum sheets riveted to aluminum structural members. The bodies are mounted on conventional wheel and axle assemblies.

To prevent any water penetration at body and roof joints, even in case of complete submersion, the builder uses a variety of sealers. All are products of Minnesota Mining & Mfg. Co.'s Adhesives & Coatings Div., Detroit.

For sealing between skins and structural members, and between deck plates and structural members, specifications call for a brown elastomeric sealer. It is applied as a bead with a calking gun, and is spread over the rivet holes after they have been drilled.

Next, the aluminum sheets are set in place and riveted to the structural members. The rivets are driven directly through the sealer bead, so that the compound forms around the fasteners to produce a tight seal. The joint not only prevents water leakage, but the compound also resists the effects of exposure to weather, oil and fuel.

On lap joints between two sections of aluminum sheet, a second bead of the same compound is forced into the lap seam. After riveting, excess sealer which has been squeezed out of the seam is cleaned off with a methyl ethyl ketone. The seam is then watertight.

Another type of sealer used is a synthetic rubber, tape-form material which is reinforced with fabric. Ribbons of this product are applied at joints between structural members and door frame extrusions, and also at the vertical butt joints formed when aluminum sheets meet at corner angle sections.

Lengths of the dry, slightly tacky ribbon are placed directly on the structural members. Sections to be attached are moved into place, whereupon the rivets are pushed through the sealer by hand. They are then drawn tightly enough to make a waterproof joint.

The ribbon sealer has enough adhesion so that it will stay in vertical or overhead positions until the sections to be joined can be brought together. If desired, it can be easily removed and replaced in any position.

Any small openings between skin sections in the trailer are sealed with either a nonhardening, synthetic rubber putty, or an extruded, permanently pliable, synthetic rubber compound. No special flow-on or pressure equipment is needed to use the extruded material, and it is applied with minimum waste.

Where rough corners have to be filled in for the sake of appearance, an aluminum-colored metal filler compound is used. When dry, this material can be sanded smooth and painted the same color as the original metal surface. The same material is used to fill and waterproof small cracks.

Still another general purpose, synthetic rubber base adhesive is used for bonding weatherstrip to all door openings in the trailers.

Final operation is a complete undercoating.

Top—Left: NUMEROUS joints and seams must be sealed to make the trailer completely waterproof.

Top—Right: ALREADY sealed at riveted areas, lap joints get a second beading of the sealer.

Bottom—Left: SEALER is applied over rivet holes in structural members before skin panels are put on.

Bottom—Right: FINAL waterproofing is a spray coating applied to the entire underbody.

Before

After

NEW YORK CITY building is surfaced inside and out in a few hours with aluminum curtain wall panels. Possibility of landing a customer order of this magnitude has anodizers interested.

New Building Trends Expand Anodizers' Market

◆ Aluminum curtain wall construction blends well with modern architectural trends . . . Pleasing appearance is coupled with potentially low cost, easy installation and little maintenance . . . Problems faced by anodizers include demands for superior coatings, essential for uniform color, shade and tone.

◆ Improved facilities are essential to cope with this growing market, up 500 pct over the past five years . . . New equipment in one firm is anodizing aluminum in lengths up to 30 ft with precisely controlled coating thickness . . . Instrumentation with regulated timing cycles is the answer to quality control in this case.

◆ ANODIZERS and sheet metal fabricators are queueing up for a look over the shoulders of many modern architects. They have good reason, for on the boards are affixed drawings of an increasing number of commercial and industrial buildings in which curtain walls are specified. Anodizing aluminum sheet for all four curtain walls on a building 12 stories or more high is a customer order of appealing magnitude.

Curtain wall construction has boomed 500 pct in the past five years, although annual tonnage of sheet and plate aluminum is only now beginning to reflect the increase. (See also THE IRON AGE, November 17, 1955, p. 78.) Expansion in use of the new construction technique continues so rapidly that some aluminum fabricators and anodizers are troubled with growing pains. One new and impressive installation anodizes 30-ft long aluminum panels that lap over two standard building stories. These panels are twice the length thought necessary by architects even as late as last year.

The new aluminum treating line at General Bronze Corp., Garden City, N. Y., turns out 6500 sq ft of panel daily, anodized on both sides. The fabricating firm has tripled its production since 1953 and now finishes about 6 tons of metal daily.

With new 32-ft long tanks, two 30 x 4 ft aluminum panels are processed every hour in an Aluminite-type process using a 15 pct sulphuric acid solution in water. Improved handling and better tank layout enable 16 anodizing cycles and completion of more than 3800 sq ft in a two-shift day. Hanson-Van Winkle-Munning Co., Matawan, N. J., designed, manufactured and installed the new setup.

The earlier anodizing line (now improved and still in operation) has a capacity of two 16 x 6-ft aluminum panels hourly, or roughly 200 sq ft. Processing 14 cycles, the line completes near 2700 sq ft in a two-shift day. Both lines employ five tanks, for caustic cleaning, two water rinses, an anodizing bath, and an anodize-sealer operation in hot water.

Demands for improved anodizing

Curtain wall pioneers like General Bronze find themselves today on a quality control treadmill. The more product improvements they make, the more anxiously architects clamor for even better treated aluminum. As architects have grown familiar with properties of anodized aluminum sheet, they have become more critical of formerly accepted defects.

Now architects know uneven aluminum oxide coatings may be responsible for an unsettling wavy pattern on building curtain walls of the metal. They know too that impurities in the anodizing solution can cause color changes detracting from the over-all aesthetic pattern of the finished building. Shading and tone resulting from the anodizing bath vary with alloy and temper of the aluminum sheet, so those qualities also are called out on the blueprints.

Controlling such factors as these requires an investment often running into many thousands of dollars. Treating lines must be carefully designed for precision control of the anodizing process, essential to attain the high plateau of quality demanded by present day specifications.

Instrumentated for accuracy

At General Bronze, need for improved quality standards and greater flexibility in the anodizing line showed clearly when contract specifications began calling for: 1) anodizing less commonly used aluminum sheet alloys, 2) a number of different coating thicknesses, some measured in fractions of a mil, and 3) a wide variety of metal configurations, including intricately stamped and embossed patterns.

Critical factors affecting uniformity, color, structure and shading of the oxide coating now are automatically controlled. Solution temperatures, flow and concentration are tested automatically at regular intervals. Thermostats, pH meters, timers, electric current regulators and other electrical devices interact to regulate the anodizing operation within optimum limits.

Purity of solution also is fully governed by means of testing procedures coupled with use of

MANUAL wipedown of large aluminum parts still is needed prior to anodizing, despite mechanization of many following operations. Quality control starts here for uniform coating.

deionized water in both anodizing tank and hot water sealer tank.

Temperature of the sulphuric acid solution is carefully maintained at 70°F by two heat exchangers and a 60-hp refrigeration unit. With both heat exchangers in operation, tank volume can be completely replaced 12 times an hour while still maintaining a constant 70°F. This feature assures an anodizing solution free of suspended or dissolved solids that may discolor the aluminum oxide coating.

Beyond quality control, the problem broke down into 1) increasing production, 2) cutting processing time, and 3) widening flexibility of the line.

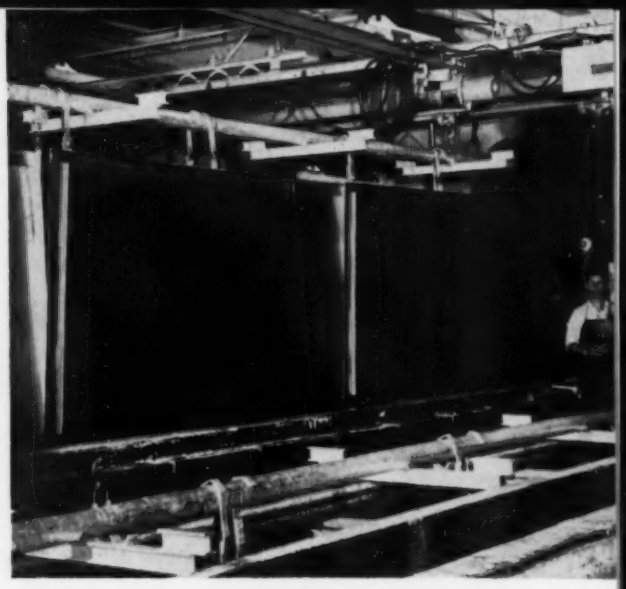
Faster transfer cycles have been made possible by a double-hoist conveyor system and a straight-line tank layout. Parts are transferred from one tank to another in a matter of seconds. Dead time between stations has been minimized.

Flexibility in the line has been achieved with an ability to handle the largest parts for which demand can reasonably be anticipated in the near future. Each tank holds 30 x 4-ft panels, and measures 32 x 2½ x 4½ ft deep. Exceptions are the two cold water rinse tanks which are 2-ft wide. All five tanks in the new anodizing line are installed on a specially-constructed acid-proof platform 30 x 45 ft.

Cold water rinse tanks are constructed of electrically-welded, ¼-in. steel plate. The hot water sealer tank has 3/16-in. stainless steel walls and bottom. The Aluminite tank is lined with a lead alloy hardened with 6 pct antimony. All piping leading to this tank is plastic.

Chemically pure water is supplied to both acid tank and sealer unit from cation-anion deionizing apparatus that holds mineral content to no more than 10 ppm of dissolved solids, exclusive of silica and carbon dioxide gas. The equipment has a deionizing capacity of 22,000 gal of water per regeneration.

The anodizing line is operated by five men. One anodizer moves material through the processing tanks, and is responsible for controlling temperatures, solutions and anodizing current.



CURTAIN WALL panels up to 30-ft long may be anodized in sulphuric acid bath. Air agitation assists in formation of smooth, even film of aluminum oxide up to 0.9 mils thick.

IN A RECENT SURVEY—

Here's What Architects Think About Curtain Walls

OPTIMISTIC

- **Enthusiasm about great and expanding uses**
- **Appearance of some current buildings is very admirable**
- **Still in infancy, but will develop into widespread use**
- **Semi-prefabrication will become more common**
- **Costs will be reduced**
- **Need for well designed inexpensive panel system for housing**

PESSIMISTIC

- **Prejudice against material by some architects**
- **Aesthetic effect achieved in many present panel buildings is unsatisfactory**
- **Inferior products will retard general acceptance of metal panels**
- **Job inaccuracies create difficult installation**
- **Current installations must be time-tested before general acceptance**
- **Special conditions of use will limit standardization**

Source: American Institute of Architects

Four other operators prepare aluminum parts for processing, including loading and unloading.

Before initiating the treatment, panels are rubbed down with solvent. The 10-minute operation requires two men. Parts then are hand-racked on an aluminum carrier that holds six sets of 30-ft parts, or four sets of 10-ft panels. The shorter parts are of more complex configuration, and nest less easily.

The loaded rack is attached to an overhead crane and moved to the caustic tank, first step in the anodizing process. Panels are cleaned by the caustic solution in 2 to 10 minutes, depending on configuration and alloy of the part. Three steel heating coils maintain a bath temperature of 140°F. Sodium hydroxide is used in a 6 oz to 1 gal concentration.

Panels then are conveyed to a cold water rinse in an adjacent tank. Dwell time is a matter of seconds, unless succeeding tanks are loaded with other parts. Water is fed at 8 gpm from the condenser pipes of the anodizing tank refrigeration unit. Dual use of water helps cut gallonage throughput and reduces costs.

Aluminum panels then are anodized in a 15 pct H_2SO_4 solution from 15 to 60 minutes, depending on coating thickness specified. A 1-hour dip builds up an Al_2O_3 film of 0.9 mil.

Titrated at regular intervals

The acid bath is titrated once daily, and water or acid is added to control concentration. Perforated pipes in the tank bottom provide air-agitation for a uniform finish on the coated parts. An electric timer notifies the operator of the end of the prescribed dwell period.

Average current requirement is 12 amp-hr for each square foot of panel surface. Current is supplied by four selenium rectifiers, each rated at 1000 amp. Rectifier control is maintained from a master panel located at the anodizing tank. The panel incorporates a triple dial system that is used to increase current flowing through the tank solution gradually as the anodizing proceeds.

Following anodizing, parts are immersed in a cold water rinse for a short time to remove excess acid. Tank interior is painted with Tygon to resist acid carry-over from the anodizing tank. As parts are lifted from the rinse tank, the anodizer washes them down with a hand brush to insure complete acid removal.

In the final tank, the anodized surface is sealed in boiling water for 10 to 15 minutes. Temperature is maintained at 212°F by four stainless steel heating coils coupled with a thermostat. Water normally flows into the tank at 3 to 4 gpm. Top flow rate is 8 gpm.

Following the hot water seal, parts are conveyed to the loading area, unracked and moved to fabrication shops. Prior to shipment, they are sprayed with clear lacquer to preserve the finish during transportation and installation.

AFTER cold water rinse stops anodizing operation, panels are scrubbed to eliminate final traces of acid. Aluminum surface then is sealed by immersion in boiling water for 15 minutes. Chemically pure water helps maintain defect-free coating.

In aluminum joining—

Good Handling Steps Up Brazing Furnace Output

- Furnace brazing goes a long way toward solving the problem of stepping up aluminum parts production . . . But don't install higher volume equipment, then hobble it by retaining less-than-adequate associated handling, processing units.

- Hotpoint Co.'s refrigerator plant worked both ends from the middle in tackling their brazing problem . . . Result is a partially automated system adequate for their needs which turns out a large volume of evaporator units faster, more economically.

BY D. W. OWEN, General Foreman, Unit Mfg., Refrigerator Plant, Hotpoint Co., Chicago

◆ WHERE production requirements warrant, introduction of furnace brazing has much to recommend it. Capitalizing most fully on furnace brazing's greater productive capacity, however, calls for a similar streamlining of associated processing and handling methods.

Hotpoint Co.'s Chicago refrigerator plant took such a two-pronged approach. Faced with the need for higher-volume production of aluminum evaporator assemblies, the company installed a continuous, high production brazing furnace; then took special pains to insure optimum processing in preparing the sheet and tubing components and in washing after brazing to remove the flux residue.

Evaporator units begin and are largely formed from single long sheets. These flat sheets are first edge-beaded to produce U-shaped grooves. Then they are cleaned and moved along to a bench where flux is applied and scrubbed into the surface by brushes. Next stop is a rubber belt conveyor. This runs to the brazing furnace. Its route is paralleled part way by racks on which are hung preformed, well-cleaned coils of aluminum tubing, which have been converging on the line from another area.

Sheets are placed on this conveyor, fluxed brazing side up. Women operators position coils on them as they move along. Short strips of a low melting aluminum alloy are spotted under the tubing at intervals. These contain from 6.8 to 8.2 pct silicon.

To hold coils in place on the sheet for brazing, notched weights of nichrome alloy are laid atop the tubes.

On arrival at the furnace, weighted assemblies are transferred to the metal belt which forms the heart of the resistance-heated GE brazing furnace. Assemblies advance through this furnace continuously, attaining during transit a maximum temperature of 1104°F, within ±4°F. This close control is required for good brazing, since temperature must be at or above the melting point of the brazing strips, but below that of the sheet and tubing.

Atmosphere control essential

In the high temperature brazing zone, close control of atmosphere is particularly essential. Assemblies continue through cooling zones after passing this area, before emerging from the furnace. In sequence, they are then discharged, spray cooled with water, and placed on edge in baskets for dipping operations. Nichrome weights, meanwhile, return by belt to operators along the conveyor line.

Basketed assemblies then shift by trolley hoist to five successive tanks in the line. Partly this is to remove and neutralize flux.

The first tank contains lukewarm rinsing water for washing. This is followed by a three

minute dip in a 2 pct solution of aluminum bifloride. This second tank solution is at room temperature, as are those in two succeeding tanks. Next comes a one-minute dip in a 20 pct solution of nitric acid, and a dip of the same duration in a fourth tank, containing one pound per gallon of Clepo 180-S. Chromic-dichromic acid in this solution helps keep surface resistance down to from 50 to 100 microhms, preventing interference with subsequent spot and Heliarc welding. A final dip in hot water completes the cleaning and helps promote rapid drying.

Assemblies are then inspected to make sure that brazing has been well done. Assemblies now transfer to one of two tangent benders.

In this operation, units are placed on the bed of a Struthers-Wells bender. As the machine closes, the assembly is bent around a form to produce an open box. This bends both the sheet and the tubing coil brazed to it, the tubing remaining on the exterior surface. Before bends are made, a backplate that has been drawn to form a shallow pan in a prior operation is placed over one side of the bending form. As the bends are made, this pan is locked in U grooves previously formed on the mating unit to receive it.

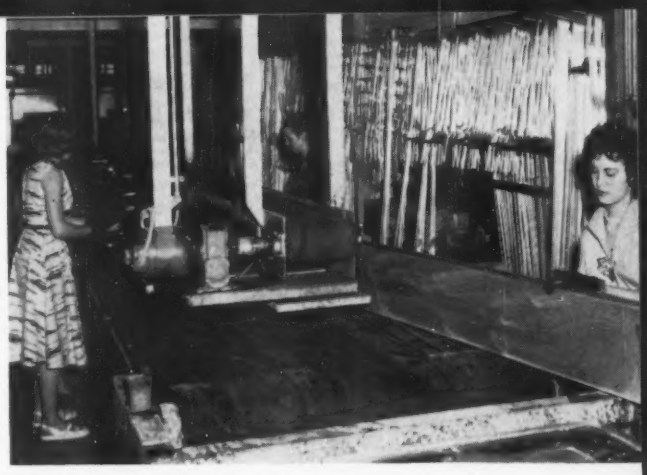
Automatically welded

Final portions of the bend bring the ends of the assembly together so that they overlap. Ends are then spot-welded while still clamped in the bender, by an automatic Federal welder incorporated into the machine cycle. Six pairs of electrodes in this welder are "fired," indexed to a new position and then fired again, thus producing 12 spot welds on each assembly.

Electrodes raise to clear the work on completion of welding and the bender is opened to release the evaporator. This is then placed on a belt conveyor for advancement to machines that make Heliarc welds to join the ends of the tube to their mating parts.

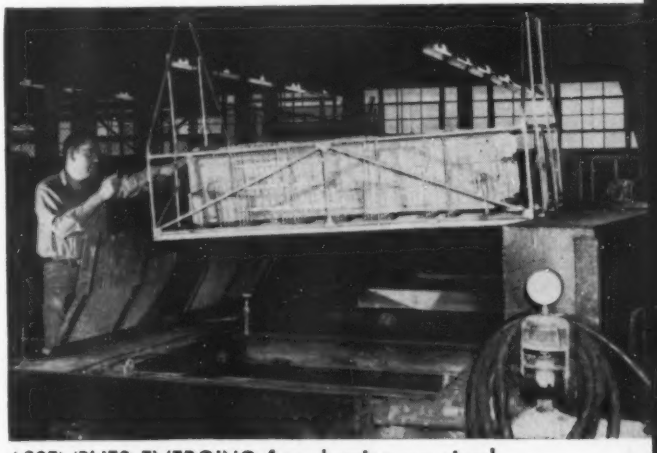
Men loading the tangent benders stand on a safety platform in front of the machines during loading. These platforms are so arranged that, should either loader be standing on the platform, a switch in a control circuit operates to make it impossible for the bender to be closed or opened.

Thus loaders are protected from being caught or injured by any motions of the machine. Buttons to operate machines are located on panels placed so that operators must step off the platform before machines can be run. Once a start button is pressed, the machine goes through an automatic cycle unless this is stopped by pressing a stop button or by platform motion, such as might be caused by anyone stepping on the platform before the automatic cycle has been completed.



FLUXED ALUMINUM sheets move along this wide rubber belt toward brazing furnace. Operators add coils, low melting aluminum alloy strips, weights as plates move along conveyor.

READY-FOR-BRAZING units are carried through continuous brazing furnace on this metal belt. Temperature, atmosphere are closely controlled.



ASSEMBLIES EMERGING from brazing are stood on edge in baskets like these, which will carry them through series of five tanks for cleaning.

Electrostatic and manual—

Dual Spray Approach Can Tailor Your Coating Line

◆ Combining electrostatic and manual paint spraying can often solve problems on your painting line which neither can solve alone . . . Inherent benefits of electrostatic spraying can thus be realized while retaining flexibility in the line.

◆ Carefully planned, a dual spray line combines high production with substantial savings in coating costs . . . Manhour productivity climbs, material loss drops and maintenance time is cut with increased production speed.

By MARTIN ABEL, Research and Development Engineer, Congress Die Casting Div., Tann Corp., Detroit

◆ COST and production tangles on your coating line can be unraveled by using the best features from each of two application methods —electrostatic and manual spraying. The advantages of electrostatic spraying are thus gained while retaining flexibility in the line. Many combinations are feasible. Well planned, such a line can often boost manhour output and reduce over-all production costs.

Application costs skid downward when such a dual setup replaces wholly manual operations. Paint loss through overspray invariably decreases. Maintenance costs of paint booths drop. Production speeds normally can be upped appreciably.

One firm now uses two electrostatic spray booths in its conveyorized coating line. The company figures if it returned to spraying each part by hand, operator productivity would be reduced 75 pct. With the new setup, coating quality is better. Less than 1 pct rework is needed.

Diecast zinc instrument panel housings are painted at 380 per hour by Congress Die Casting Division of Tann Corp., Detroit. By combining manual and electrostatic spraying, average coverage has been raised to 350 sq ft per gallon of paint. Paint consumption averages 130 pieces per gallon. A synthetic metallic enamel is used with 25 pct thinner.

Primer coat is automatically applied by electrostatic means as the cast housings move along a conveyor at 10 fpm. No rotation of parts is required. Spraying is continuous.

A highly atomized, high-pressure color coating is then applied. Manual spraying in five quick strokes insures coverage of hard-to-reach areas and builds up film thickness. Curtains and paint sag are avoided by control of application conditions. Less than 0.0005 in. of paint is applied in this operation.

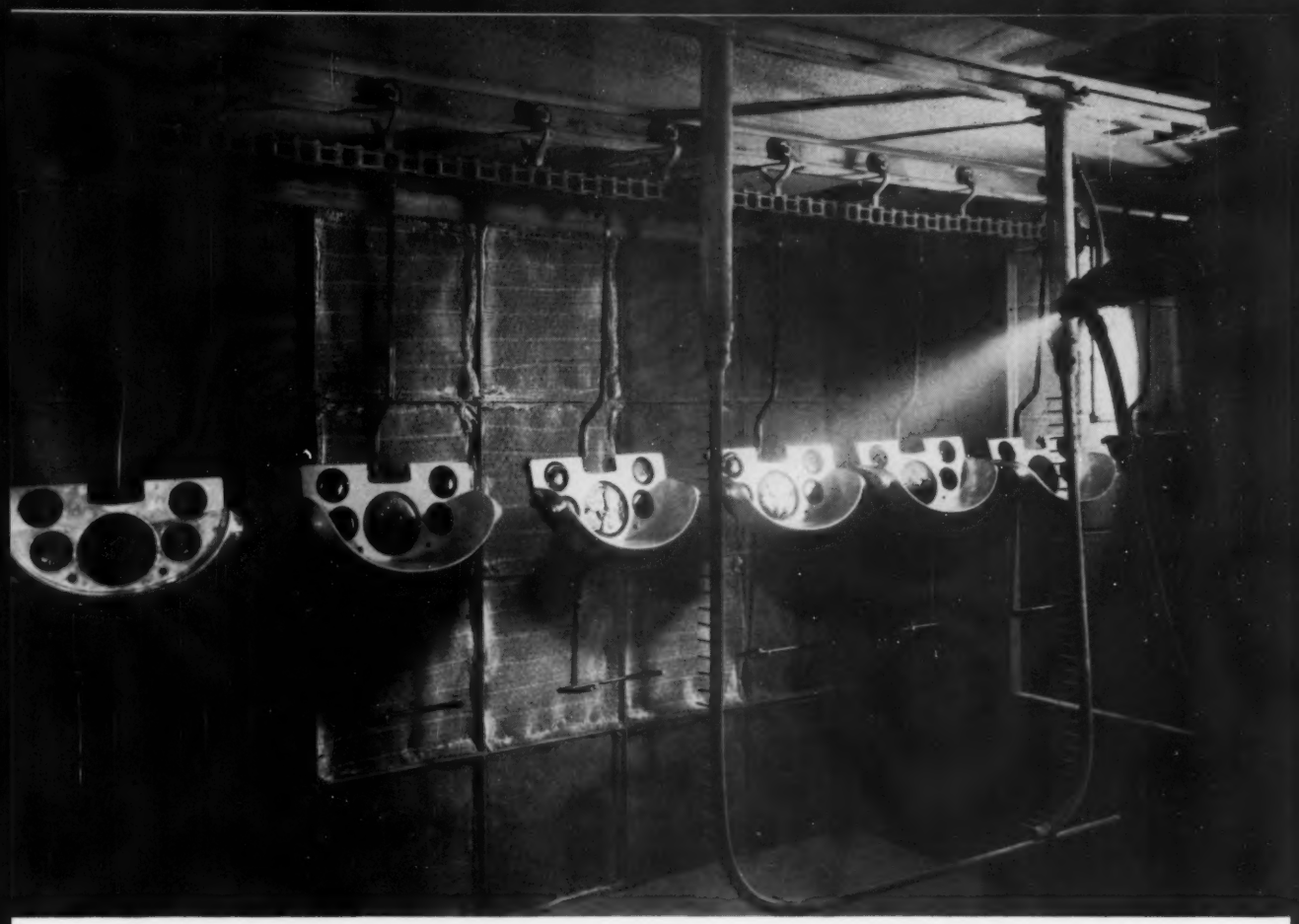
Final 0.001-in. coat is deposited electrostatically in a third spray booth, using two stationary, automatic guns which operate continuously. Where a two-tone finish is specified, it is handled manually.

Housings are produced in diecasting machines located on the first floor of the building. After trimming, parts are inspected and buffed. Castings must be entirely free of blisters and cold checks.

Back of each housing is shielded to prevent paint splatters and preserve the reflecting surface of the original casting. Shields naturally accumulate some paint, but cleaning has not been a serious problem.

Instrument panel parts are conveyed through the entire cleaning, spraying and drying cycle. Conveyor hooks for this particular job are spaced 18 in. apart.

Prior to painting, cast housings are carried by overhead conveyor through a five-stage Jenson washer which includes: 1) washing at 160°F with detergent, 2) water rinse at 140°F,



SINGLE gun primes diecast housings continuously as parts pass at 10 fpm. Atomized paint is positively charged on moving through 130,000 v grid, settles on parts grounded by conveyor.

3) phosphate spraying at 140°F, 4) water rinse at room temperature, and 5) mild chromic acid rinse at 140°F. The mild rinse treatment lowers surface tension and speeds drying.

After emerging from the washer, conveyed parts double back through infra-red ovens where they dry in circulating hot air. Housings reach drying temperature of about 250°F in less than 2½ minutes. Rapid circulation of hot air eliminates a later tack-off operation.

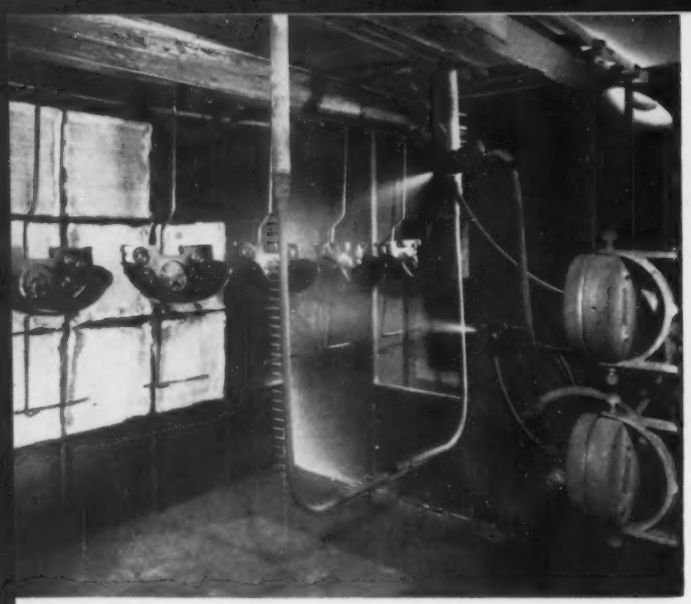
Diecast housings cool to approximately 100°F before entering the electrostatic spray booth for flash priming. Primer dries in about 3 minutes. Spray booth is simply constructed, and includes an exhaust fan and curtains.

Charged at 130,000 v

Heavy transformers are used in the Genco electrostatic spray equipment. Normal voltage is 130,000, but a peak voltage of 180,000 is permissible. Current employed is 1.75 milliamperes. Rectifying tubes convert 60-cycle alternating current to direct current. Paint particles are positively charged, and are attracted to the grounded parts on the conveyor.

A single spray gun is located about 2½ ft

MANUAL spray operation follows priming after 3 minute dry. Five quick strokes fill in areas missed by electrostatic spray and build up film thickness.



FINAL color coat requires two continuously-operating guns, precisely adjusted for full coverage. Housings move past at 6 per minute. Enamel is later baked on casting at 275°F.

FLIP-TYPE mask simplifies two-tone finish, required on about half of instrument panel housings. Final operation coats castings with a thin film of fast-drying lacquer.

from the production line and operates continuously as parts move past at six pieces a minute.

With continuous spraying, it has been estimated there is less than 25 pct overspray carried away from this booth by the fans. Filters employed in the operation are easily replaced, or may simply be dusted off and reinstalled for further service. Air is supplied at 150 fpm.

After priming, diecast housings are conveyed to an adjacent spray booth where the first color coat is manually applied. Objective in this operation is to get paint into areas not readily coated by the electrostatic method, and to build up film thickness. Air pressure to gun is 70 lb. Paint pressure is 25 lb.

Deposited from two guns

Final color coat also is electrostatically applied using two continuously-operating guns. One gun is angled down toward the top surface of the die casting. The second gun points upward at the lower section of the casting. It is located 12 in. to the left of the first gun, and about 2½ ft from the work. If necessary, a third gun can be installed operating at right angles to the parts.

Position of the guns was established after considerable experimentation. Gun location must be established individually for each job.

Spray booth is stripped to essentials. No water curtain is necessary. Only a few of the filters are changed each day. In the preceding manual-spray booth, about three-quarters of the filters are changed daily.

The metallic finish is baked as the castings are carried through an oven at 275°F. After cooling, parts requiring a two-tone finish are sprayed manually using a flip-type mask. About half the parts are finished in two colors.

Plant layout is such that parts may either be directed into a two-tone finish booth, or continue to the final coating operation for a light spray with fast-drying lacquer.

A number of safety precautions are taken to insure job quality and to protect the operators. The electrostatic unit stops automatically in the event of: 1) conveyor stoppage, 2) exhaust air cutoff, 3) part too close to the electrostatic grid, 4) operator too close to the grid, 5) electrostatic arc, or 6) electrostatic cutoff.

Productivity per manhour on the spray line is quite high. The present system has proved very satisfactory from standpoints of quality, uniformity of film thickness and coating adherence.

Specifications call for the painted diecast housings to withstand a 200-hour salt spray test. Parts easily meet this requirement. Tests made thus far indicate a life of approximately 300 hours under standard salt spray test conditions.

At present, the paint line is used only for one product, instrument panel housings. The system is designed so a quick changeover to other parts can be accomplished with few alterations in the line. Washing and drying operations are expected to remain essentially standard. Electrostatic spraying operations will differ only in that additional spray guns or change in position of the guns will be needed. If necessary, provision can be made to rotate parts, although this need is not now anticipated.

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John Ruskin knew what he was talking about when he wrote: "There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are his prey." Just as this applies to ice cream or magnetos or wool socks, so does it apply to gears.

This "cheap price" paid for a necessarily cheap product may not prove to be such a bargain if the ultimate cost of using such a product can be determined. In the case of gears, each of the following points directly affects *final* cost: 1. The "price tag" on the gear itself. 2. Extra assembly time wasted in fitting and salvaging "off color" gears. 3. Lack of reasonable service life. 4. Excessive noise. The first point is obvious, and the second becomes so upon observation: for not until the gears have been assembled, "run off," and passed by inspection can the direct cost of the gears be determined. Often part or all of the potential savings on "price" are lost (often without even being recognized) on the assembly floor. Points three and four represent more insidious and hard-to-measure costs—but costs that can be even more damaging, for they will be measured by your *customer*, and can easily spell the difference between repeat orders or a customer lost for good.

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New Technical Literature:

Catalogs and Bulletins

Carbide tools

A new carbide tool catalog No. "CC" covering recent developments and additions to a company line of carbide drills and cutting tools has been issued. It contains 64 pages of listings, illustrations, specifications and helpful technical information. *Union Twist Drill Co.*

For free copy circle No. 1 on postcard, p. 89

Brazing alloy

Four-page folder describes and illustrates a low-temperature silver brazing alloy for use on nonferrous pipe and tubing systems. Application photographs show lines and systems in which this brazing method was used. *Handy & Harman.*

For free copy circle No. 2 on postcard, p. 89

Deep throat presses

Bulletin 61C discusses a line of enclosed, front-to-back, deep throat presses available in 8 different models from 22 to 150 ton capacity. Construction and operating features are described and illustrated for the units which were designed to perform a variety of blanking, forming, drawing, perforating, combination die and automatic feeding operations. *Niagara Machine & Tool Works.*

For free copy circle No. 3 on postcard, p. 89

Materials handling

A survey (Job Study No. 128) shows how, by installing a new materials handling system, a stove company has reduced materials handling costs 67 pct and greatly increased plant storage capacity. It describes how a maker of gas ranges, dryers and disposers now uses 15 fork lift trucks to expedite its receiving, processing, storage and shipping operations. *Towmotor Corp.*

For free copy circle No. 4 on postcard, p. 89

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 89.

Abrasive separators

The importance of proper blast cleaning abrasive separation to efficient cleaning room operations is emphasized in a new 8-page booklet (Bulletin No. 1003) recently issued. Four types of separators are described which handle from 33,000 to 320,000 lb/hr of abrasive. Fifteen photographs and drawings illustrate the principles of operation and the types of equipment available. *Pangborn Corp.*

For free copy circle No. 5 on postcard, p. 89

Metalworking presses

A manufacturer of hydraulic presses and valves for every purpose announces the availability of a new brochure describing hydraulic presses for the metalworking industry. This 4-page brochure shows a few of the firm's many presses developed for the metalworking industry — presses for bending, cogging, flanging, forging, forming, straightening, and upsetting operations. *The R. D. Wood Co.*

For free copy circle No. 6 on postcard, p. 89

Wire rope slings

A new catalog just issued features a company line of slings and fittings. The 80-page catalog illustrates and describes 54 sling types with accompanying capacity tables for each. The most commonly used fittings are also illustrated with capacity tables. *Wire Rope Corp.*

For free copy circle No. 7 on postcard, p. 89

FREE TECHNICAL LITERATURE

Power units

A 20-page bulletin describes a line of hydraulic power units and their use in step drilling and other machining operations. The new bulletin shows four sizes of these units for feeding and rotating cutting tools. Incorporated in special machines, these units are used for drilling, spot-facing, counterboring and reaming operations. Engineering information, complete specifications and examples of typical applications are included. *Ex-Cell-O Corp.*

For free copy circle No. 8 on postcard, p. 89

Sump pumps

Bulletin No. 4500 provides a keyed selection from a company line of sump pumps based on capacity in gpm and total head in feet. Motor size ranges from ½ to 75 hp and motor characteristics may also be specified. Pumps range in discharge sizes from 1½ to 6 in. with capacities to 1000 gpm and heads to 75 ft. *The Deming Co.*

For free copy circle No. 9 on postcard, p. 89

Foundry refractories

A new 16-page catalog describes plastic and castable refractories, cements and mortars from packaging to completed installation. It also outlines many applications in ferrous and non-ferrous metal furnaces, aluminum reverberatory melting furnaces, annealing ovens and heat treating furnaces. Typical applications and suggestions on how to use plastics, castables, cements and mortars, are also included. *Ramtite Co.*

For free copy circle No. 10 on postcard, p. 89

Fuse links

A 12-page, 2-color booklet on standard fuse links is now available. The publication, GEA-6264, covers the use of both fast and slow-melting cable-type links in distribution cutouts with ratings up to 15,000 v. These fuse links are mechanically and electrically interchangeable with other makes of EEI-NEMA standard links. The booklet gives time-current curves and co-ordination tables to help utilities make the changeover to the standard links. *General Electric Co.*

For free copy circle No. 11 on postcard, p. 89

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Every metalworking man—engineer, buyer, executive—should read this new booklet presenting many up-to-date facts about the *flowability* of Cold Heading Wire. It contains illustrations, diagrams, and technical facts useful to anyone in the modern, wire fastener industry. See how the most complicated and intricate parts can be cold headed. Mail coupon today for your free copy!

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KEYSTONE WIRE for Industry

FREE TECHNICAL LITERATURE

Carloading chart

A carloading check chart for anchored loads is offered. Prepared for shipping room and loading dock personnel, it is designed to provide a clear, simple illustrated chart on carloading procedures for wall anchored loads. This chart includes instructions for preparing the car, wrapping anchor plates, draping the car, bulkhead construction, and use of strapping tools. *Signode Steel Strapping Co.*

For free copy circle No. 12 on postcard, p. 89

Nuts and bolts

A booklet entitled "Let's Talk Nuts and Bolts," is now available. It was prepared to highlight the difference in nuts and bolts, a difference dependent upon the quality of material from which they are made, the type of heat-treating they receive and the type of inspection given them before use. It is also available in French, Spanish and Portuguese. *Caterpillar Tractor Co.*

For free copy circle No. 13 on postcard, p. 89

Swarf salvage

A new booklet describing the benefits of collecting swarf from diamond wheel grinding operations and salvaging the worn out diamond wheel stubs is available. This booklet includes such information as where swarf can be sent for reclamation, value of diamonds salvaged (up to $1.70 per carat), and types of swarf which are acceptable for salvage. *Norton Co.*

For free copy circle No. 14 on postcard, p. 89

Variable speed drives

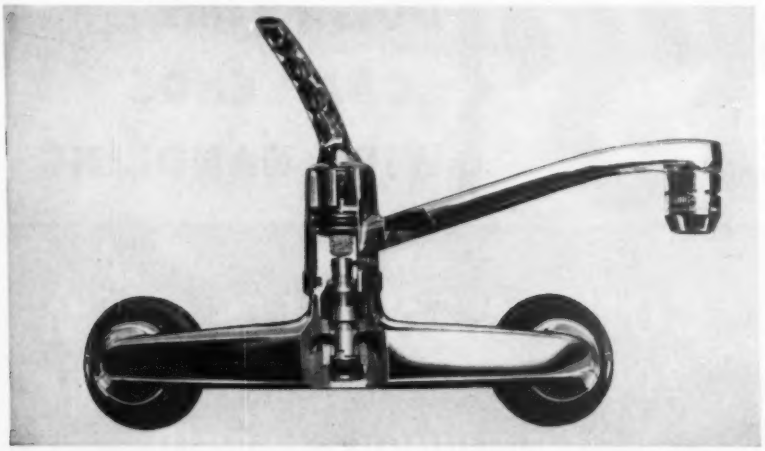
A new 4-page bulletin, "How to Care for Jr.," describes and illustrates the program available to keep a company line of drives in operation at peak efficiency. Prepared primarily for maintenance engineers, the bulletin explains the complete line of services and parts available for these electronic variable-speed drives. Information in the bulletin also includes a complete listing of parts and prices, and instructions on how the various plans may be put into effect. *Reliance Electric & Eng. Co.*

For free copy circle No. 15 on postcard, p. 89

BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co. — Reporting new developments in copper-base alloys and metalworking methods.



Modern, Single-Handle Faucet Relies on Bridgeport Alloys for Precision-Fit Parts

A practical answer to scalded hands at the kitchen sink is the ingenious, precision Moen faucet made by Ravenna Metal Products Corporation, Seattle.

Replacing the traditional valve-and-washer system with a stem and ported-piston assembly, this faucet mixes hot and cold water to temperatures predetermined by the position of its single handle. Precision-fitted parts eliminate washers and assure watertight connections.

Recognizing that a simplified design often requires expert metallurgical and production knowledge to specify the proper materials, Ravenna asked Bridgeport Technical Service for assistance in materials selection.

This new faucet design placed double responsibility on the materials. All had to meet stringent machining requirements. Each finished part had extensive performance specifications. During test runs with conventional alloys, machining difficulties occurred. Then service failures developed, season-cracking among them.

Technical Service studies for Ravenna indicated that certain Bridgeport alloys, made to ASTM specifications with exact tempers and stress relief anneals, would meet all requirements. And, all machined parts could be made by straight machining on Ravenna's standard Warner & Swasey automatics.

For the spray, valve escutcheon and escutcheon nut, specifications stipulated the use of hard-temper Bridgeport Alloy T-64. Supplied in tube form, this high-leaded alloy is ideal for operations involving extensive machining.

For packing nut, spout end, brass body, body nuts, lock nut and jam nut, the specifications called for Ledrite 6 half-hard brass rod. This is a free-cutting alloy uniform in composition. It assures accurate dimensions and minimizes tool wear.

For spout tubing Bridgeport recommended light-drawn Alloy 69, a cartridge brass, highly ductile and well adapted to both cold-working and severe forming operations.

Radically different requirements were necessary for the anchor washer and discs. Here the studies recommended the use of Bridgeport F-3034 10% Phosphor Bronze D because its characteristics facilitated manufacturing and gave desired wear resistance.

In every instance, Ravenna has found that the alloy characteristics essential to manufacture also assure satisfactory service life in the finished product.

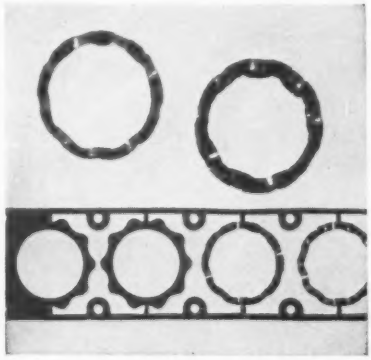
Whenever you plan to simplify or redesign your products, let Bridgeport Technical Service contribute its metallurgical studies and recommendations. This service, available from Bridgeport Sales Offices, can help you achieve manufacturing efficiency and product satisfaction.

Unique Ball Bearings Use Retainer Cages of Bridgeport Brass

Stephens-Adamson Manufacturing Company of Aurora, Illinois, produces the well-known Sealmaster ball bearing unit, widely used in mining, agriculture, textile and heavy-duty applications. Sealmaster bearings are designed to operate under severe atmospheric conditions with a minimum of maintenance.

Unique bearing cages accurately space the balls to distribute radial and thrust loads and at the same time trap and hold grease and prevent its churning. To make these retainer cages, Stephens-Adamson uses Bridgeport F-37 cartridge brass, soft, as recommended by Bridgeport Technical Service.

Smaller cages are made by progressive die operations. Larger cages are press-formed from blanked-out rings, the separate halves being riveted together.



Bridgeport Alloy F-37, developed primarily for the production of artillery shells and small arms cartridges, is a superior material for products which are deep-drawn, spun or progressively machined.

For Sealmaster bearings, Alloy F-37 is supplied in widths up to 9 inches. The easy working qualities of this Bridgeport alloy make it ideal for this application. In other cases, too, there is usually a preferable Bridgeport alloy. Technical Service can help you find it. A call to your nearest Bridgeport Sales Office will make all arrangements.

(4626)

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Mills at Bridgeport, Conn., Indianapolis, Ind., and Adrian, Mich. Sales Offices in Principal Cities— Conveniently Located Warehouses

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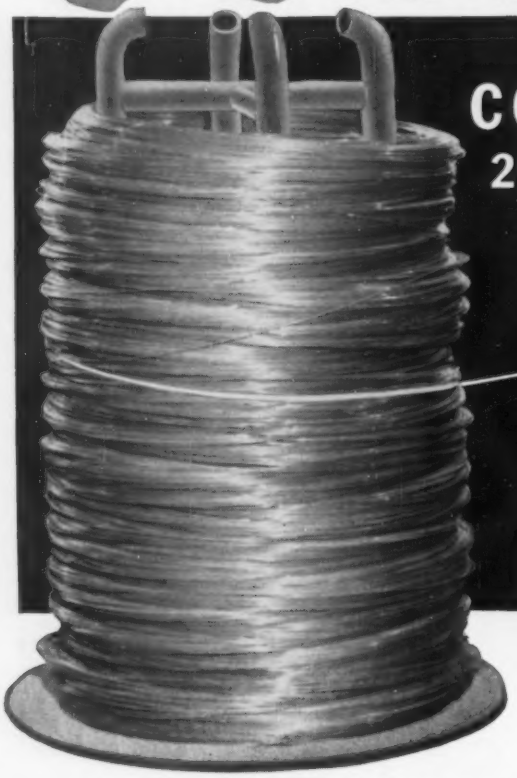

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Continuous length wire coils of 2000# to 3000# catchweight are now available with Continental's new ECONO-COIL—in practically any temper, analysis and size, from 14 gage through ½" diameter inclusive, produced from low carbon and medium low carbon steels. Scrap loss is cut 70 to 90 percent. Material handling and changeovers are reduced to a minimum. Labor costs are substantially reduced. ECONO-COILS are shipped on specially designed returnable carriers. If you use wire you *need* ECONO-COIL, the super coil that brings you super savings! Write or wire today for full particulars.

This is the ECONO-COIL Carrier

Full Carriers can be stacked for easy and efficient warehousing, and empties can nest for economy in return shipping.

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STEEL CORPORATION · KOKOMO, INDIANA

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 84

Tape winder

A 4-page folder describes a new model tape winder designed for application in a variety of tape producing equipment—teletype, ticker, automatic typewriter, accounting and computing machines. Features such as feeding of tape from any position, exclusive clutch release and delayed action winding are covered. *Cycle Equipment Co.*

For free copy circle No. 16 on postcard

Tractor

A tractor, Model HD-6, with a weight of 12,400 lb, a drawbar hp of 45 and a belt hp of 55 is described in a 8-page folder. Details are given on its frame construction, steering and gear mechanism, lubrication, diesel engine, six speed transmission and other features. Specifications and a list of matched equipment and accessories are included. *Allis-Chalmers.*

For free copy circle No. 17 on postcard

Rubber linings

A new catalog of corrosion, abrasion, and contamination resistant rubber linings for tanks, pipe, valves, and similar storage and process equipment has just been issued. Illustrated, it contains many useful charts, tables and diagrams, along with specifications and suggestions covering tanks for the chemical, process, and plating industries. The catalog contains helpful suggestions for effecting economies in the bulk handling of chemicals, and a complete guide for the proper selection of lining for use with a wide variety of acids, alkalies, plating solutions and abrasive compounds. *Raybestos-Manhattan, Inc.*

For free copy circle No. 18 on postcard

Stearates

A new 36-page bulletin outlining the properties and uses of metallic stearates has been published for the information of purchasing, technical and executive personnel. The bulletin lists the composition of 46 metallic stearates, shows graphically the industries in which they are used and presents an analysis of recommended applications. Other helpful data include an explanation of one company's analytical procedures, government specifications for metallic stearates, shipping information and a guide to products. *Witco Chemical Co.*

For free copy circle No. 19 on postcard

Vibration mountings

Selection and application data for all-metal shock and vibration mountings for presses, machine tools and other industrial equipment is provided in a new bulletin. Design of the mountings features Met-L-Flex stainless steel, fabricated wire cushions, providing resiliency and resistance to grease, oil, solvents and temperature extremes. Special engineering services also are described in the bulletin. *Robinson Aviation, Inc.*

For free copy circle No. 20 on postcard

Enclosed motor

Well-illustrated brochure discusses a new motor designed to offer full protection from any operational hazard which does not require totally-enclosed construction. The features of the motor, including asbestos insulation to resist heat and moisture, are covered in text and shown with photographs and diagrams. *U. S. Electrical Motors, Inc.*

For free copy circle No. 21 on postcard

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **1/19/56**

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Casting

An illustrated booklet entitled "How to Melt and Cast Aluminum Alloys" was reportedly written because most casting problems are the result of improper melting and casting practices due to new and more widespread use of a growing variety of aluminum alloys. The booklet covers: proper pouring temperatures, how to minimize drossing, how to de-gas the metal, how to avoid air entrapment, gating and risering practices to eliminate solidification cracking, use of holding kettles and types of furnaces to use. *The George Sall Metals Co.*

For free copy circle No. 22 on postcard

Special wire shapes

Technical Bulletin T-2 describes a company's special shaped wire, available in a variety of nickel alloys and stainless steels. The 4-page bulletin presents detailed information on available shapes, sizes and materials, and discusses several interesting applications of shaped wire. *Alloy Metal Wire Div., H. K. Porter Co., Inc.*

For free copy circle No. 23 on postcard

Motor, generator brush

An 8-page booklet featuring a general purpose industrial motor and generator brush is announced. Written for designers of electrical equipment, electrical and maintenance superintendents, and purchasing agents, it discusses the new brush especially recommended where heavy load-swings require exceptional brush characteristics to assure smooth, trouble-free operation and optimum commutation under all service conditions. *National Carbon Co., Div of Union Carbide and Carbon Corp.*

For free copy circle No. 24 on postcard

Aluminum construction

"Aluminum Products for Industrial Construction," is the title of a booklet for the industrial designer and builder which offers section details on vault frames, stadium seat brackets, manhole steps, tread plate and similar products. *Aluminum Co. of America.*

For free copy circle No. 25 on postcard

Stamper

Designed for high-speed stamping production, a new press is described and illustrated in a 4-page folder. Features of this Model C-15 such as its ball bearing ram and integral feed mechanism are covered in detail while specifications are included. *Precision Welder and Flexopress Corp.*

For free copy circle No. 26 on postcard

Transducers

A new, fully illustrated booklet entitled "Design of Nickel Magnetostriction Transducers" has just been issued. The booklet summarizes all practical experiments to guide the engineer toward a workable design in exploring new fields in the sonic and ultrasonic regions. A magnetostrictive transducer is used to convert electrical input energy to mechanical output energy or mechanical input energy to electrical output energy. *The International Nickel Co., Inc.*

For free copy circle No. 27 on postcard

Paint spray booths

A new booklet "Recommendations for charging, masking, and purging wet paint spray booths" is now available from a manufacturer and national distributor of paint spray booth cleaners and other industrial processing and cleaning compounds. The booklet gives recommendations for handling paint spray booth compounds, charging booths and keeping them up to strength, periodical booth purging, masking dry areas, collecting overspray for reclamation and handling special problems. *DuBois Co.*

For free copy circle No. 28 on postcard

Industrial cars

Twenty different custom designed industrial cars, which are representative of a manufacturer's car building facilities and design services, illustrated and described in a 32-page booklet. The cars shown in the catalog were designed for use in steel plant facilities, raw materials handling and specialized types of rail transportation. *United States Steel Corp.*

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Village Station
NEW YORK 14, N. Y.

FIRST CLASS
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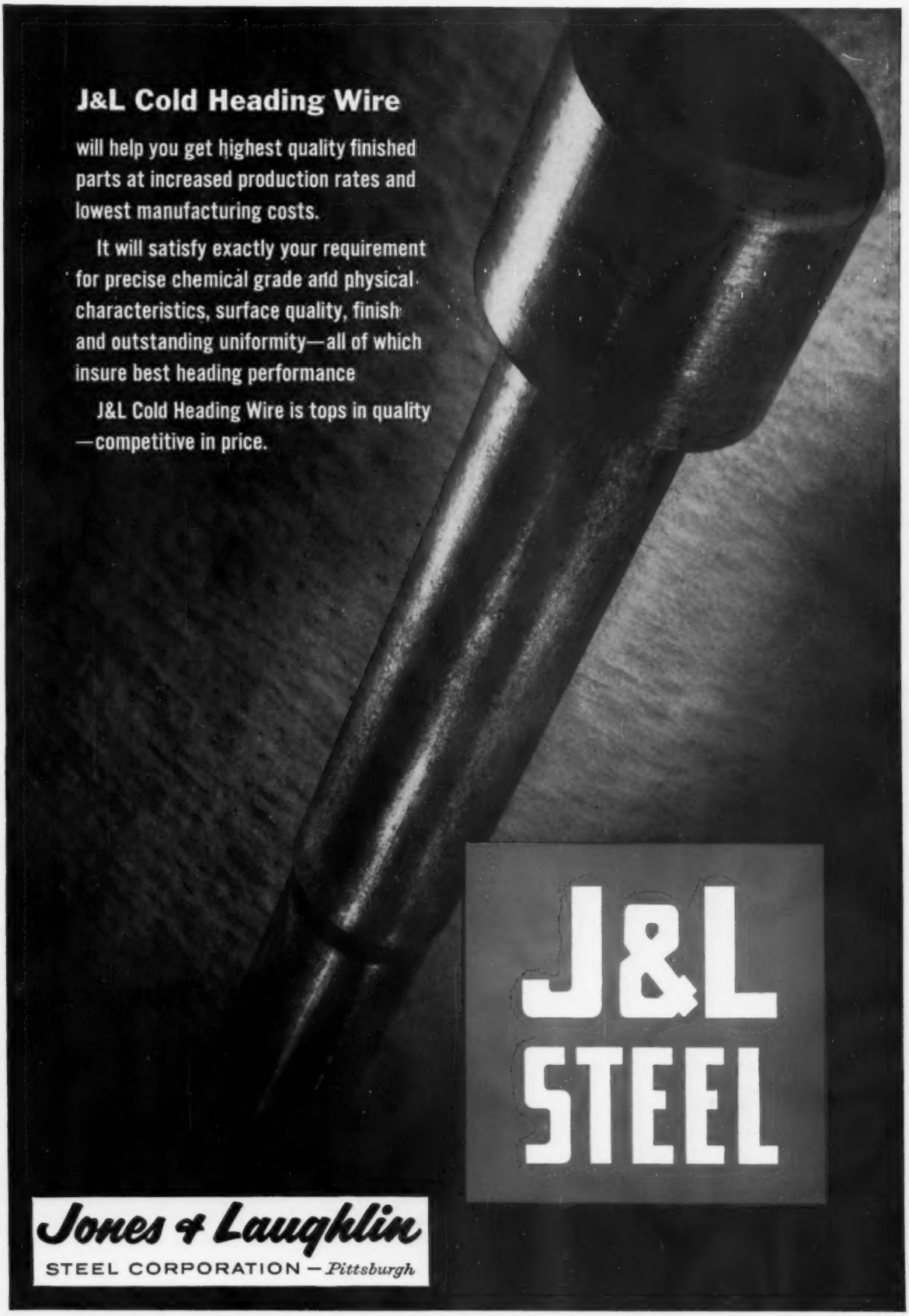
J&L Cold Heading Wire
will help you get highest quality finished parts at increased production rates and lowest manufacturing costs.
It will satisfy exactly your requirement for precise chemical grade and physical characteristics, surface quality, finish and outstanding uniformity—all of which insure best heading performance
J&L Cold Heading Wire is tops in quality —competitive in price.
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ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

HANDLING: Tongs Move Ingots

Efficient, safe transport of aluminum ingots ranging in weight to above 1½ ton is achieved with semi-gantry crane and specially designed tongs.

The best way to handle cylindrical aluminum ingots destined for extruding in the 14,000 ton press—with a minimum of labor and maintenance, plus a maximum of flexibility and safety was found when the Aluminum Company of America leased the world's largest extrusion press from the Air Force and installed it in the Alcoa plant at Lafayette, Ind.

The equipment that the company installed to solve this problem included conveyors, racks, a semi-gantry motorized crane and tongs specifically designed to lift and transport the ingots.

Heavy Weight a Problem

After the huge extrusion press was set up, ingot conveyors were constructed to extend out into an 80-ft plant bay. This bay was served by a heavy capacity overhead crane. Some ingots that were to be extruded into aircraft component parts would weigh more than a ton and a half. The best crane to serve the press appeared to be a semi-gantry. The overhead crane was thus kept available for other tasks.

Industrial Crane & Hoist Corp., Chicago, installed the motorized semi-gantry in this bay. It operates beneath, and completely independent of, the giant overhead crane.

Procedure Described

Aluminum ingots are stacked in steel racks 10 ft from the receiving end of the conveyor. The semi-gantry is positioned over a rack and the wire rope hoist drops a pair of locked-open tongs on the upper ingot.

These tongs, made by Heppenstall Co., Pittsburgh, firmly grasp the cylindrical ingot as the hoist raises at the demand of its operator, who stands on the floor nearby at a pendant control.

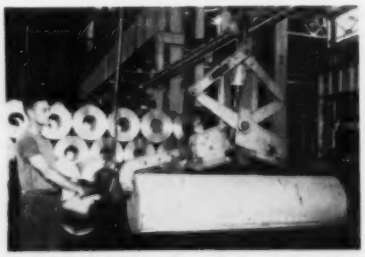
Jaws Automatically Open

With the tongs and load raised, the operator directs the semi-gantry to move some 10 ft to a conveyor which feeds to the manipulator at the heating station serving the press. During this operation the tongs hold the burden firmly and will not release.

As the ingot is laid upon the conveyor, the jaws of the tongs automatically open. They remain locked in an open position until they return to grasp the next ingot in the rack. These Heppenstall tongs also are used when ingots must be transported from the return conveyor to a storage rack.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 89. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Tongs, shown placing ingot on conveyor, are production aid.

Brazing:

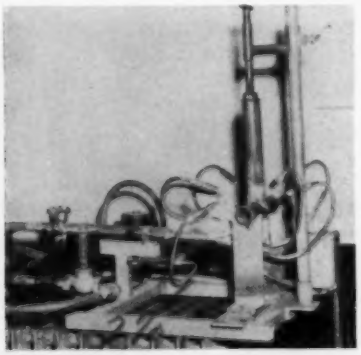
Technique uses bead filler, applies alloy inside

A novel brazing method for structural joints in steel tubing, which has been developed by the Elyria Welding Service, Elyria, Ohio, utilizing bronze beads for filler metal and applying the brazing alloy from the inside is reported as fast, economical of brazing alloy, and providing uniform brazing quality. Its principal application is in structural assemblies of tubing in the sizes used for furniture.

When fabricating a T-joint in tubing, the most economical way to prepare the stem member is a mechanical notch. To avoid the expense of very close tolerances on fit-up, a bronze brazing alloy is used because it will fill an appreciable gap and make a strong bond without the necessity for a perfectly snug fit all around.

Jig Holds Flange

Basis of the inside brazing technique developed by Jacobs is a jig on which is mounted a multiple-tip torch that heats the entire joint simultaneously, and use of a flux-bearing flame to prevent oxidation and avoid leaving scale or flux residue on the work. The jig holds the flange member of the T horizontally and the stem is held vertically above it.



Tube brazing jig with parts loaded, ready to braze.

Brazing heat is supplied from a standard oxy-acetylene welding torch fitted with an adapter which

How would you SOLVE IT?

1 PRODUCTION PROBLEM: To speed production and cut costs of removing extra-thick weld seams from 2¾ ton industrial boiler drums. Drums are made of 1" thick steel sections, welded together. Wickes Boiler Co. was using grinding wheels—found them slow, unsatisfactory.

2 SOLUTION: A 3M Representative suggested that this Saginaw, Michigan, manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on a swing grinder. Manufacturer found that each 3M belt removed these extra-heavy-duty welds faster, better.

3 RESULTS: An immediate production increase with much higher quality finishes. (Note: manufacturer experimented with a "Brand X" belt, found it averaged only 9 feet of weld per belt . . . 3M belt removed 30 feet!) A 3M Representative can help you solve your grinding and finishing problems, too. Call him today. There's no cost or obligation.

Made in U.S.A. by Minnesota Mining and Manufacturing Company. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing.

WANT MORE INFORMATION?

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3M

"Tips arranged to distribute heat evenly around joint . . . "

holds six flame-descaling tips on copper tubing leads. The tips are arranged so as to distribute the heat evenly around the joint. An auxiliary tube with a small tip serves as a pilot light. Solenoids in the oxygen and acetylene lines hooked up with a snap switch turn the brazing flames on and off.

A dual fluxing system is part of the technique. Acetylene from the tank passes through a Gasfluxer on its way to the torch and picks up a controlled amount of flux. This assures that the proper amount of flux is delivered to the brazing area whenever and for as long as the flame plays on it. The notched end of the vertical tube is dipped into a saturated solution of boric acid just before assembly, providing flux for the inside area where the flame does not reach.

Beads Poured In Tube

When the assembly is secured in the jig, a scoopful of the bronze beads are poured into the vertical tube and the brazing flames are started. Aided by capillarity, the molten bronze will flow through the joint wherever it has been wet with flux. The flux-bearing flame envelopes all of the joint on the outside, promotes filling of the joint and leaves the outside surface so clean that no grinding or brushing is needed before finishing. The operator shuts off the flame as soon as the brazing alloy starts to come through to the outside of the joint.

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For Heavy Duty Operations
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12" Overhang, 1¾" Capacity

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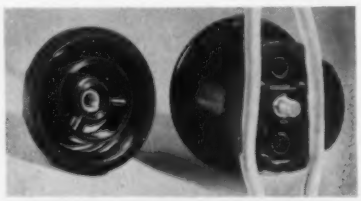
EDLUND Representatives in major cities

Methods:

Push insert provides internal threading

The need to tap internal threads in a hole to receive a threaded screw or bolt may be eliminated by the development of new push insert manufactured by the Heli-Coil Corp., Danbury, Conn. This push insert is pushed into a straight-sided, plain hole to provide strong, wear resistant female threads in non-structural parts. The hole can be drilled, molded or die cast.



Threads of insert have strength to impale wires on prongs.

For quantities of up to 1200 per hr, tooling consists merely of a mandrel. The mandrel may be used in any device with a suitable stroke for pushing the insert into the hole such as a drill press, kick press, arbor press or air piston. Rotation is not required.

Processed only by nature!...

Offered only by Norton!...

A "natural" for many barrel-finishing applications. The new Tumblex "N" abrasive, offered exclusively by Norton comes in sizes ranging from 3/16" by 3/8" to 1 5/8" by 2 1/2".

NEW TUMBLEX "N" TUMBLING ABRASIVE

Natural abrasive brings value-adding, cost-cutting "TOUCH of GOLD" advantages to barrel-finishing

Tumblex "N" Abrasive is Nature's own tumbling abrasive. Carefully selected and graded by Norton, it opens up new possibilities for barrel-finishing applications such as light deburring, breaking sharp edges, polishing and burnishing and other operations where little actual cut is required. It is especially suited for work on die castings.

Tumblex "N" has proved particularly valuable in bringing out the most desirable color of the finished part. Metals on which it has proved its ability to give an excellent finish include zinc, brass, copper, aluminum and various forms of steel, including stainless.

Its rounded, uniform shape and very low breakdown ratio permit longer cycles and reduce the need of rescreening.

Another big Tumblex "N" advantage is extremely uniform cutting action. This assures the same uniform finishing in load after load. Also, it enables close regulation of cut; for example, by adding measured quantities of loose abrasive grain to Tumblex "N" you can speed up the rate of cut with little effect on the life of this natural abrasive. Exact formulas for best results in job or production tumbling are easily worked out.

Norton customers who have tested Tumblex "N" Abrasive report:

- ***"Very good luster with no noticeable wear."***
- ***"Fine performance. Very little breakdown. Reordering 700 pounds of sizes 2½T and 3½T."***
- ***"Color O.K. on both zinc and brass."***
- ***"Very long life. Gave excellent color on stainless steel."***
- ***"A good polishing stone on aluminum."***

Send Your Work Samples

Let us demonstrate in our newly enlarged Sample Processing Department how Tumblex "N" Abrasive can give the value-adding "Touch of Gold" to your product quality and cut your barrel-finishing time and costs. NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. G-303

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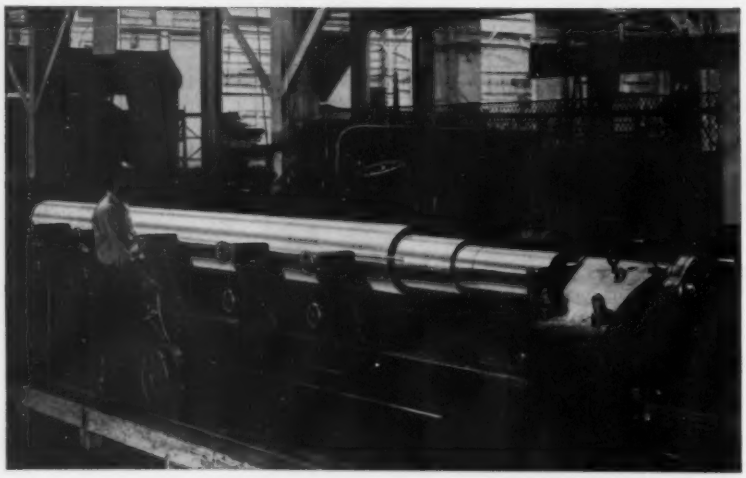
"Wedge top coil of insert into parent material . . ."

The push insert is recommended for the entire family of plastics; zinc die castings, permanent mold and sand casting alloys; wrought, die cast and cast aluminum alloys; lead base casting alloys; soft copper base alloys; and ferrous metals under certain conditions.

When the screw is turned into the threads provided by the insert, a run-out thread on the screw automatically wedges the top coil of the insert into the parent material which securely anchors it. In the case of light metals, a simple staking operation, consisting of upsetting the metal around the hole, may be used as an alternate method of anchoring. Simple tooling is available to stake the insert by the same stroke that installs it. The insert can also be installed from the back in the case of through holes to press against a retaining shoulder. The shoulder can be obtained by counterboring, step drilling, molding or die casting.

STEEL MILL ROLLS
by
TITUSVILLE FORGE



ALL TYPES AND SIZES FORGED AND GROUND TO YOUR SPECIFICATIONS

Plate rolls—bending rolls—back up rolls—straightening rolls—table rollers and other mill rolls are dependably forged and ground in any size—to any specification at Titusville Forge. Illustrated above is a straightening roll being ground on our 42" Landis Grinder. Size is 16" diameter x 28'3⅛" long, 40/45 scleriscope hardness.

Rely on Titusville Forge for rolls that meet your specific requirements.

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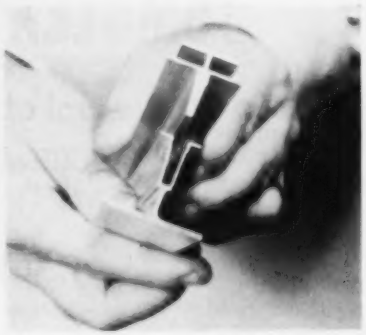
TITUSVILLE FORGE DIVISION
TITUSVILLE, PA.
PLANTS AT TITUSVILLE, PA., and WARREN, PA.
Offices in Principal Cities

Materials:

Snap-on members speed wall installation.

An interior wall system recently developed by Erdle Perforating Co., Inc., Rochester, N. Y., with assistance by Aluminum Co. of America's sales development division is claimed to be the perfect answer to an interior transformation of any living or working area. Five different extruded aluminum channels form the basis for this unique snap-on, snap-off wall. Included in the extrusions are inside and outside corners, edging, firring and snap-on members.

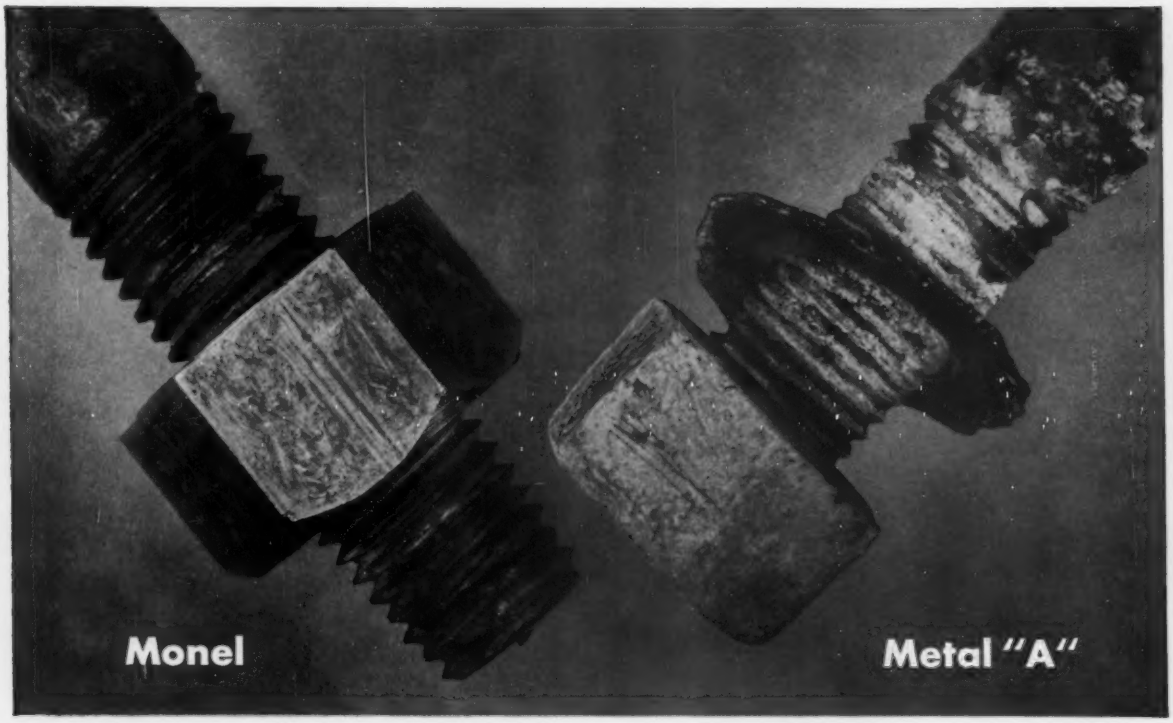


These aluminum extrusions form basis of the snap-on wall.

Quickly Accomplished

Describing the erection of the wall, Erdle states that complete room installation can be accomplished in only a few hours with a hammer or screwdriver. Once the firring, edging and corner channels are in place, the major part of the work is finished. Channels can be attached to the old walls or studs with nails or screws. If desired, adhesives can be used.

Perforated hardboard or metal



Compare these "take-up" threads...

You can tighten Monel pickling tank tie rods years longer

Look at the evidence . . . evidence you can duplicate.

The threads tell the story of Monel tie-rods' corrosion resistance. Monel does not dezincify and so the threads in front of the nut are as good as they look . . . all sound metal.

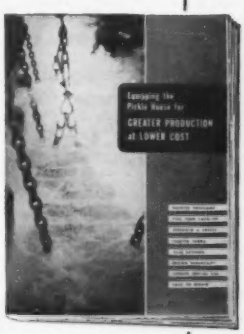
So when you need take-up thread, you have it, with Monel. You have it for many years.

Monel tie rods, users say, ordinarily outlast both the original wood tank and at least one replacement. One steel mill superintendent, for example, reports, "Monel tie rods gave us 19 years service on two old tanks . . . 22 years on two others." (The acid is 6-10% sulfuric at 180°F.)

Tight tanks save acid— Many users state that acid saving alone repays the first cost of Monel tie rods. They tell of other things they like, too . . . *Monel strength*, under tensions applied in tightening and by swelling timbers, *Monel toughness*, these rods take the wear and tear of pickling service in their stride.

New booklet packed with equipment suggestions

See and read about many recent developments in Monel equipment for the pickle house. A spanking new 32-page Inco booklet, "Equipping the Pickle House for Greater Production at Lower Cost" gives illustrations and performance information. Tells how *you* can take advantage of Monel in designing your equipment. Write today.



THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **Monel**... for pickling equipment

panels are then inserted into the snap-on member and clicked into place. By merely snapping panels into or out of position, walls may be replaced, painted or cleaned.

The unique snap-on design will also permit easy installation of acoustical ceilings. For coverage of high walls and large ceiling areas, the aluminum channels are available in lengths from 8 to 20 ft and perforated and metal panels in widths up to 4 ft.

Pickling:

Problem of pickling wastes gets serious study

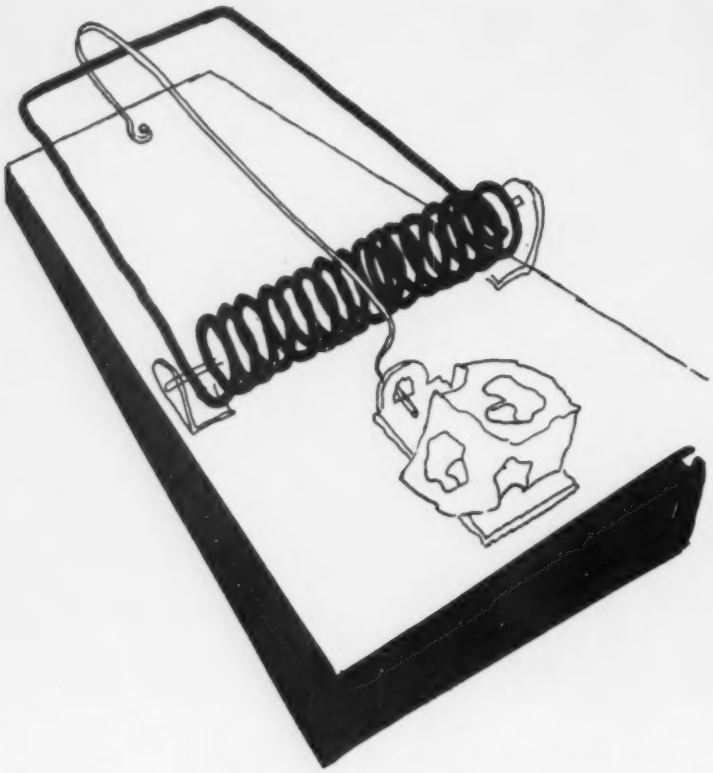
Plans to co-sponsor the building and operation of a demonstration plant expected to prove a practical solution to the perennial problem of treating and disposing of waste pickling liquors from steel operations has been announced by eight major companies in the metallurgical field.

The cooperative undertaking by Blaw-Knox Co., Jones and Laughlin Steel Corp., National Steel Corp., Pittsburgh Steel Co., Republic Steel Corp., United States Steel Corp., Wheeling Steel Co., and Youngstown Sheet and Tube Co. will use a new process designed to regenerate pickling solutions.

A semi-commercial unit, rated at 650 ton of sulfuric acid per year, will be erected on Republic Steel Corp.'s site at Niles, Ohio, where spent acids from the Niles Works operations will be treated. Blaw-Knox Co.'s Chemical Plants Division is proceeding with engineering, construction and operation of the facilities. Initial operation is scheduled for late summer of 1956.

Current Methods Unsatisfactory

A great deal of research has been conducted on the disposal and treatment of pickle liquor, the volume of which is now estimated at more than 600 million gallons per year in the United States. Currently, the predominant method of treatment is by neutralization of the acid content with alkalis and discharging of the resultant sludge



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If you are trying to patch up holes in your production schedule, then it's high time that you switched to CIMCOOL®, the world's largest selling chemical cutting fluid. Here's how CIMCOOL can save you money and increase your production.

- **CIMCOOL INCREASES TOOL LIFE** (and thus reduces down-time) because of its chemical lubricity.
- **FASTER SPEEDS** are possible because CIMCOOL cools faster, for it combines friction reduction and cooling capacity in a degree never before attained.
- **CIMCOOL COSTS LESS** than old-fashioned cutting fluids because it lasts longer. It also cuts labor costs for cleaning and changing. It virtually eliminates rancidity and foul odors. And because of its low surface tension and low adhesion to work and chips, there is practically no carry off.

But these are only a few of the CIMCOOL Concentrate advantages that will help you sew up savings in your plant. Let us tell you about the other advantages—soon—and give you details on the entire family of CIMCOOL Cutting Fluids. Just contact us and we'll have one of our Cincinnati Milling-trained machinists call on you—without cost or obligation. Wire, write or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

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CIMPLUS The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.

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for 100% *of all metal cutting jobs*

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Mr. H. T. Anderson, Jones & Laughlin Lubrication Engineer and Gulf Sales Engineer C. D. Gilchrist discuss lubrication of the 11-inch rod mill. Gulf E.P. Lubricants provide effective protection for the pinion stands and gear drives, while Gulf XXX Lubricant safeguards the roll neck bearings.

Finishing train pinion stands also get effective lubrication with Gulf E.P. Lubricants.

Jones & Laughlin uses the extreme pressure lubricants that provide *protection plus*...

Gulf E. P. Lubricants

Protection plus means that in addition to their extra load carrying capacity, their ability to prevent scoring and welding, Gulf E.P. Lubricants have other advantages that help Jones & Laughlin and many other steel companies get more effective lubrication and lower maintenance costs.

Gulf E.P. Lubricants have excellent water separating and rust preventive properties, exceptional stability, and effective nonfoaming and noncorrosive characteristics. And because of Gulf E.P. Lubricants' superior film strength, it is often possible to reduce the number of lubricants needed and simplify your storage and handling.

When you next order gear drive lubricants, make it an order for safe, sure protection and lower maintenance costs—specify Gulf E.P. Lubricants.

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into lagoons where the material is dewatered. This is not satisfactory due to high cost and the accumulation of large quantities of sludge presenting a difficult disposal problem.

Aim for Reusable Materials

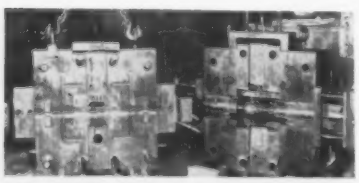
The Blaw-Knox Ruthner process, which will be demonstrated in the new facility, aims at a completely positive answer to this problem by producing only reusable materials with no by-products. In the process the entire sulfate equivalent of the waste pickle liquor is regenerated as fresh sulfuric acid for reuse in pickling of steel. The iron in the pickle solution is recovered as essentially pure iron oxide, which is recharged to the blast furnaces.

Diecasting:

Cost of housing cut with magnesium casting.

Redesign of an aircraft inverter housing to a magnesium die casting has resulted in a cost saving of about 54 pct, according to engineers of Jack & Heintz, Inc., Cleveland, where the part was previously sand cast.

Inverters on aircraft are used to convert the available direct current to alternating current for powering much of the aircraft's auxiliary equipment. The inverter must be lightweight, cool-running, and require minimal maintenance. The use of a die cast housing plays a major role in meeting these demands.



Magnesium housing made in this die requires less machining.

Machining Reduced

Magnesium alloy (ASTM Spec. B94-47T, Alloy AZ91, SAE 501) was specified primarily because of the weight factor—2/3 of aluminum, ¼ of zinc or steel—and the metal's mechanical properties including long fatigue life. Die casting was specified with the aim of getting intricate coring and close tolerance parts, thus eliminating some machining and reducing a major portion.

The largest magnesium die casting machine in the country is used to produce the housing, which is completely ribbed around its central portion. Integrally cast with the housing are its mounting feet. In addition to stationary cores, four sliding cores are incorporated into the one-cavity die which produces approximately 5,000 housings a year for Jack & Heintz.

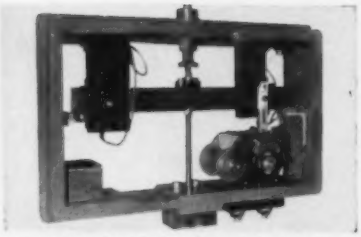
Machining:

Carbide cutter ends chipping on two tough jobs.

Facing forged steel lugs inside a pressure vessel and machining an eccentric shaft of hot rolled bar stock, both severe interrupted cutting operations, are two recently reported applications offered of the edge strength and resistance to breakage of Kennametal Grade K21 cutting carbide. The pressure vessel made of boiler plate was worked on at the Newport News Shipbuilding and Dry Dock Co. in Virginia. Here the new steel cutting carbide was used to face four lugs welded to the interior of the vessel. Rough turning the SAE 1045 eccentric shaft was a rugged interrupted cutting job performed at the Niagara Machine and Tool Corp., Buffalo, N. Y.

Chipping Eliminated

To machine the lugs, using a 50-hp, 12 ft vertical mill and a brazed tool, it was necessary to extend the ram of the vertical boring mill 42 in. The tool projected another 4 3/8 in. The jolting jump cut presented by the four lugs had previously caused severe chipping and breakage. With the Grade K21, two to four pieces were machined per grind without chipping.



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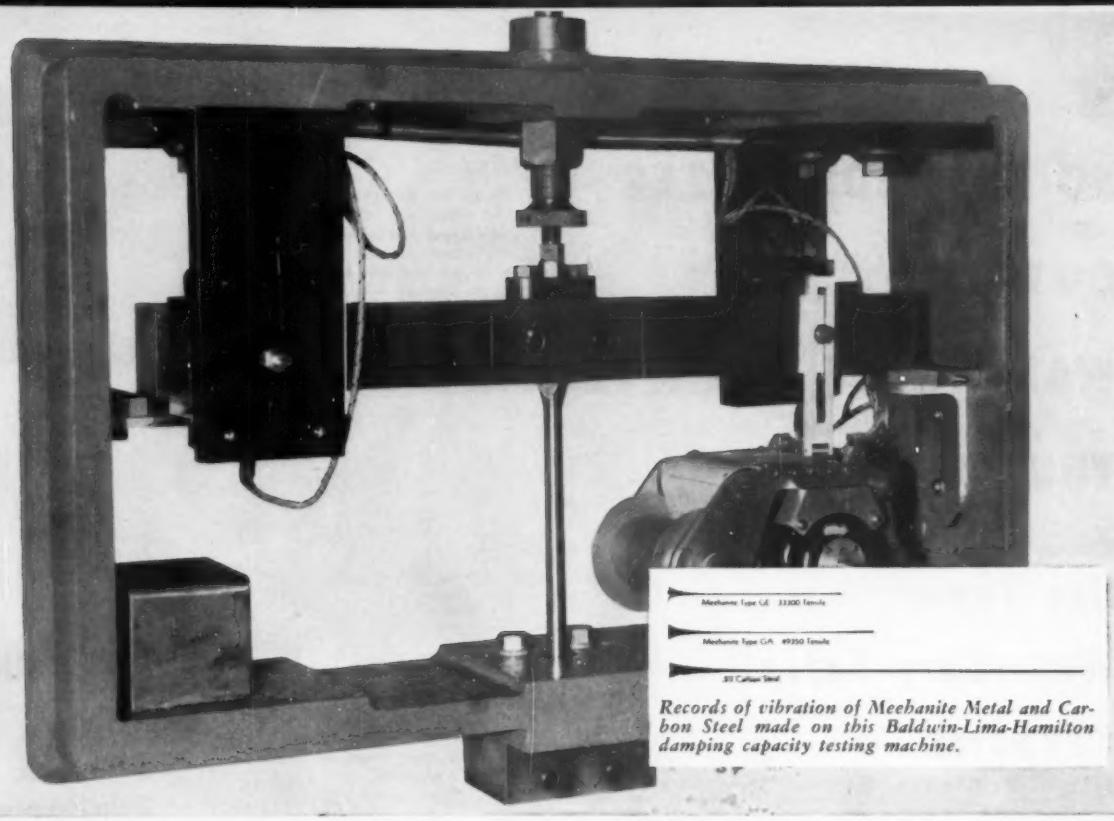
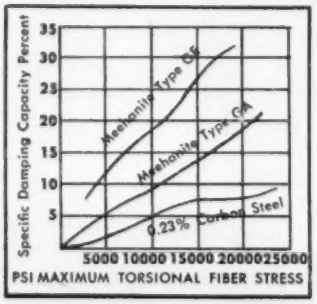


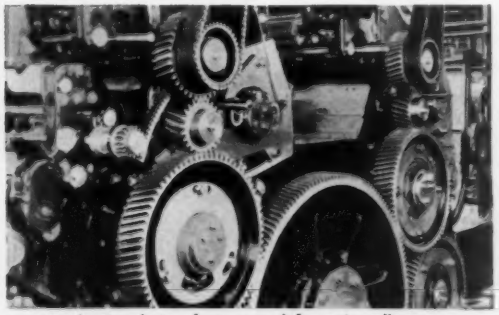
Records of vibration of Meehanite Metal and Carbon Steel made on this Baldwin-Lima-Hamilton damping capacity testing machine.

MEEHANITE CASTINGS POSSESS SUPERIOR VIBRATION DAMPING PROPERTIES AT HIGH STRESS RANGES

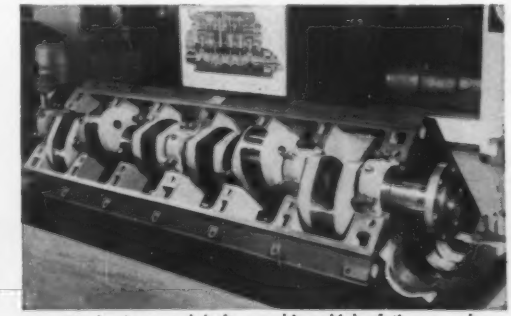


Extreme accuracy in precision machinery and high fatigue life of repeatedly stressed machined parts can be assured with Meehanite Metal castings. Uniform graphite distribution in Meehanite castings provides high damping capacity — 3 times that of steel — (see graph) to absorb built-up stresses due to vibrations. A wholly pearlitic base structure provides the necessary high strength and wear resistance.

Combining the best features of cast iron and steel with other engineered properties, Meehanite castings are uniformly solid and dense, free from defects and readily machinable. *For additional information write to Meehanite Metal Corporation, New Rochelle, New York.*



Meehanite chain of gears and fountain rolls assure perfect register and minimum friction and noise in high speed printing operations.



Meehanite crankshafts combine high fatigue and wear resisting properties with excellent damping qualities that reduce resonant vibrations and provide smoother engine performance.

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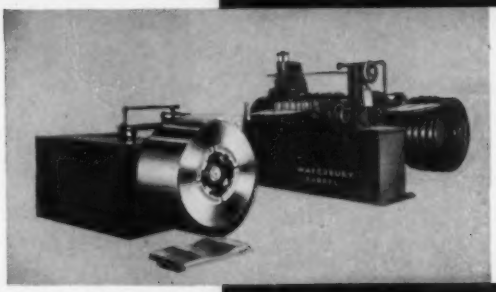
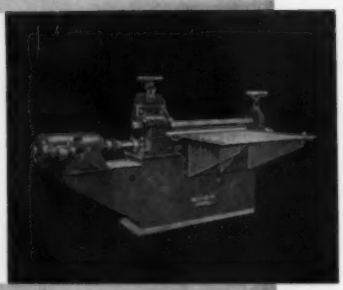
Embodied in each piece of WF warehouse equipment is the up-to-date design and sound engineering which have built Waterbury Farrel's reputation in metal-working machinery since 1851.

Write for further details on any of the units shown or mentioned here.

Eleven Roll Straightener. 1⅞" diameter x 14" face rolls. Upper rolls individually adjustable. Straighteners are available in a range of sizes with roll diameters and widths to meet varying requirements.



Gang slitting line consisting of payoff stand, coil lift, slitter and winder—built in various sizes to handle a wide range of gauges and widths.



Gang slitting machine arranged for slitting sheet stock—also available in several sizes.

Portable Roll Feed Straightener With Detachable Coil Box. Has variable speed drive and feed rolls on the front side. Nine 1¼"x 7" rolls. Other sizes available.

18" Motor-driven Cut off Saw for rods and tubes. Fully enclosed, including hinged saw guard.

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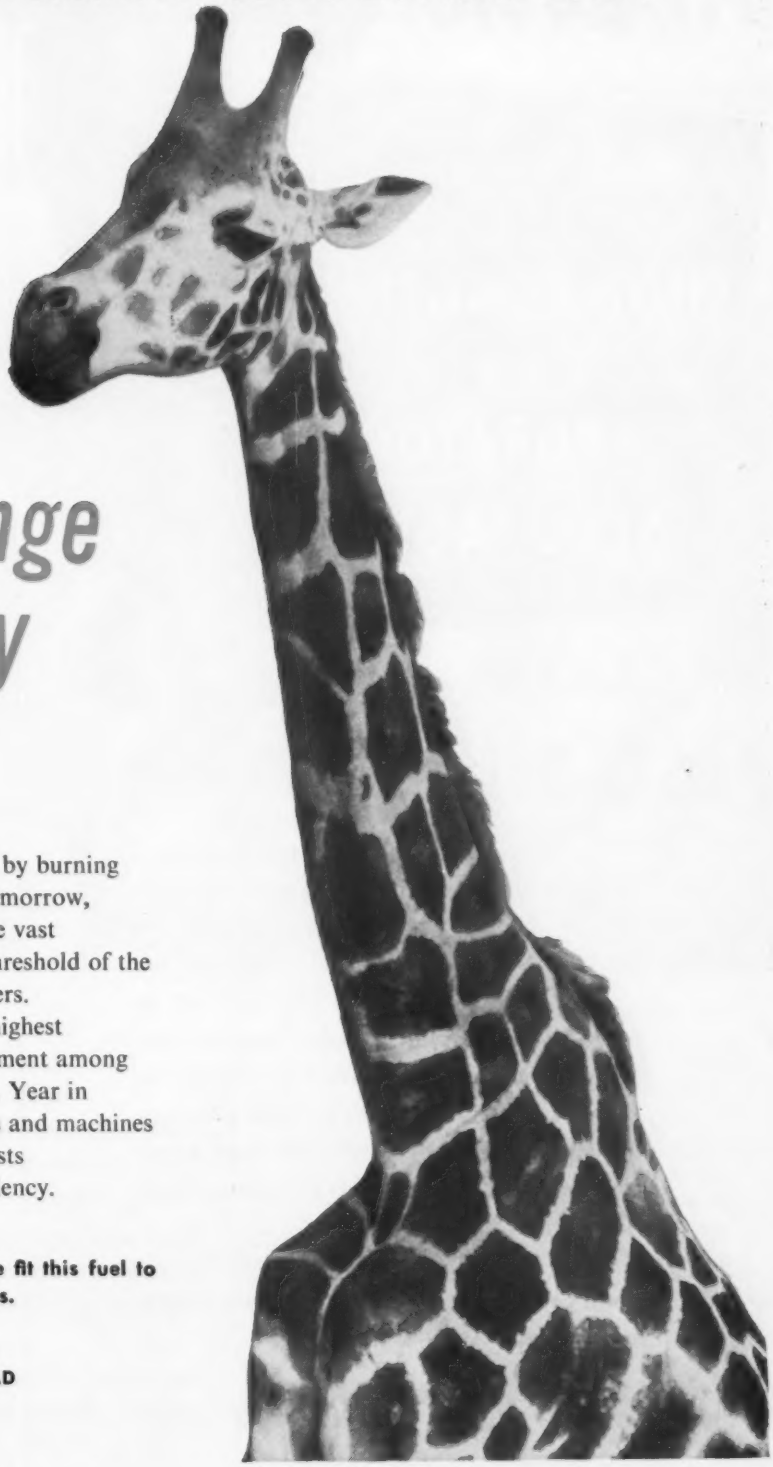

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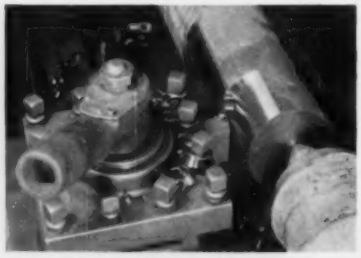
The Niagara operation consisted of turning 5¾ in. diam bar stock —¾ in. off center—with a Kennamatic Style TAR-86 triangular insert tool. Length of the cut was



Carbide cutter simplifies machining of eccentric shaft end.

10½ in. and five cuts, with 7/16 in. maximum depth of cut, were required to reduce the end of the shaft to proper diameter.

Testing:

Device aids plotting of elongation.

A standard metallurgical elongation test consists of taking a metal sample about a half inch in diameter and roughly five inches long, placing it in strong mechanical jaws and pulling the sample to the breaking point, at the same time measuring the force exerted before breaking. Two pieces of information are gained from this test—the force exerted at the breaking point, and the total elongation before breaking.

Westinghouse Electric Corp. metallurgists are obtaining a much more realistic picture of the behavior of metals by plotting true stress and true strain curves for the material in tension, basing the stress and strain measurements on the changing dimensions. This information can be used not only to determine the effects of heat treatment, chemical composition and mechanical working, but can also be used to predict the behavior of the material under other more complex states of stress, such as those found in combined stress tests and forming operations.

Investigation by metallurgists shows that the standard tension

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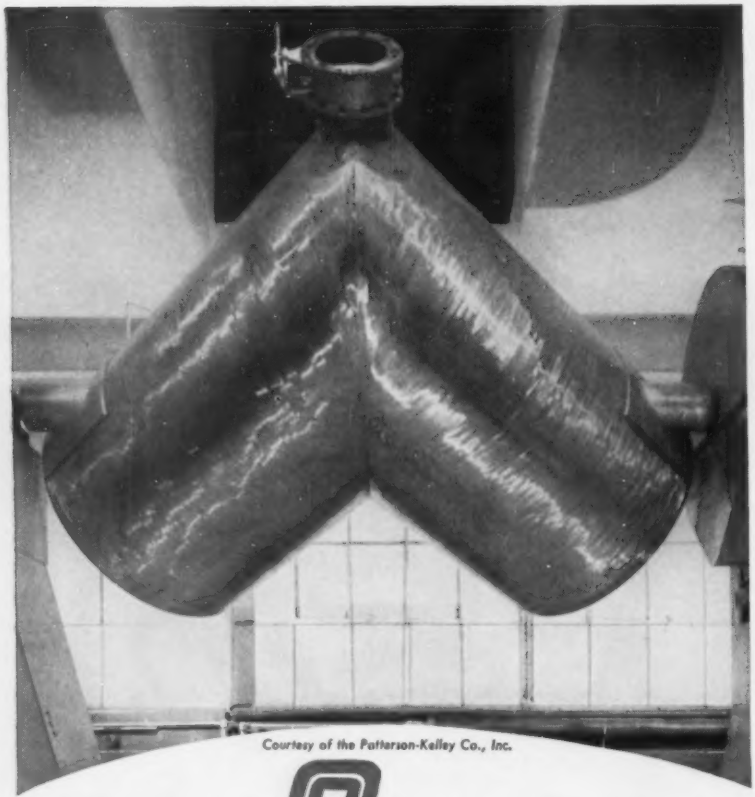


Courtesy of the Patterson-Kelley Co., Inc.

WELD WITH ARCOS

STAINLESS ELECTRODES

This precision blender is used for uniform mixing of vitamins and potent drugs with inactive materials where lack of uniformity or contamination would have serious results. The same high standard of performance is provided by the Arcos Electrodes used to weld the twin-cones. They provide smooth unbroken joints whose uniform *stainless* and sound mechanical properties are the result of conscientious quality control in their manufacture. When you want stainless welds with properties equal to the material being welded, specify Arcos Electrodes. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

test would provide the needed information for the complex stress conditions mentioned if the diameter of the specimen could be measured constantly during the test. However, no tension test would be accurate if it were stopped at various points to measure the diameter with a conventional micrometer. A special new device clamps around the half inch thick specimen and accurately and automatically follows the "necking down" of the specimen to the point of breakage. Thus investigation time is reduced and more valuable data is obtained.

Machining:

Chemical milling useful for aircraft work.

A production procedure to handle large volume requirements for chemically milled parts — developed by the United States Chemical Milling Corp. of Los Angeles — is used by North American Aviation in removing metal from airframes by controlled etching to achieve minimum weight without sacrificing required strength, particularly in supersonic aircraft and missiles.

This chemical milling is reported to have many decided advantages and in many cases performs jobs impossible by conventional techniques. The new method is applicable to short runs as well as production quantities. In contrast to machine milling, even a single part can be processed economically.

Examples of chemically milled aircraft frame parts.

Various Shapes Handled

Complex contoured shapes, spheres, cones; broad or narrow cuts; and comparatively sharp corners—are all said to be handled by the new process. Removal

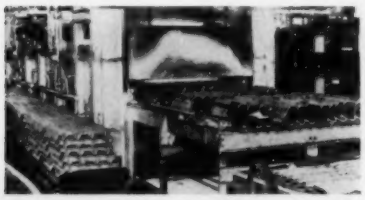
of metal on any surface or on more than one side of a part at the same time is also described as possible.

Machining restrictions on size or shape of part, direction of cut, or radius of cutter are claimed to be eliminated with chemical milling, with any part which can be immersed in a liquid capable of being chemically milled.

Heat Treating:

High alloy castings aid in processing.

Heat treating operations at the Tractor Works of the International Harvester Co., Chicago, illustrate how modern high volume heat-treating practice can be mechanized with the aid of high alloy castings. Almost every type of heat treating operation—carburizing, normalizing, hardening, annealing — is carried on at the Tractor Works, to achieve different physical and mechanical properties in a wide variety of metal parts of different shape and size — gears, links, gear housings, sprockets, shafts, axles, and the like.



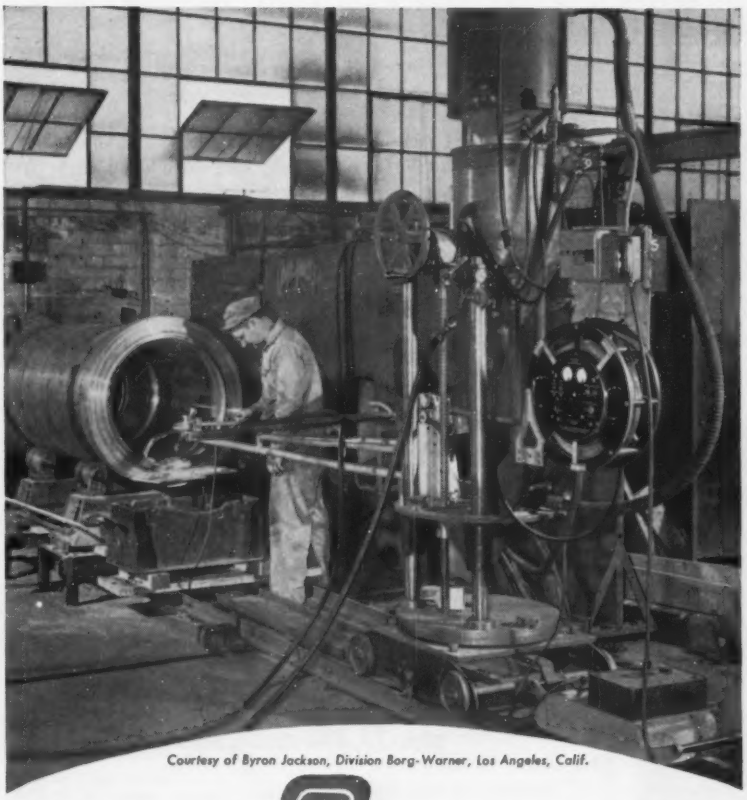
High alloy castings form rails used in heat-treating process.

For proper heat-treating, each of these types of parts must be separately loaded on special trays and fixtures which expose the surfaces to best advantage for the desired heat treatment. Working with International Harvester heat treating engineers, Holcroft and Company have designed and built new heat treating furnaces to accommodate the expanded needs of the Tractor Works. Typical of the problems met is the following case.

Differential Hardness Problem

In hardening track shoes a special problem in mass heat-treating

How to *guarantee* yourself the positive benefits of submerged arc welding

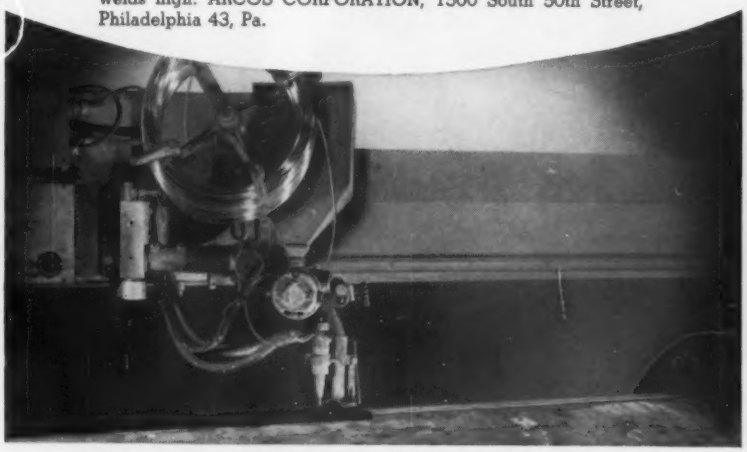


Courtesy of Byron Jackson, Division Borg-Warner, Los Angeles, Calif.

WELD WITH ARCOS

STAINLESS COILED WIRE

To save time and money, submerged arc welding was used to overlay type 308 stainless weld metal on the inside of this barrel of a boiler pump. Arcos Chromar Coiled Wire helped guarantee these savings through fast, easy deposition with minimum dilution. On your own jobs, Chromar Coiled Wire . . . *quality controlled* . . . teamed with the time-saving advantages of submerged arc welding will keep your welding costs down and the quality of your welds high. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



arises. Because the shoes are made in various sizes, special consideration must be given to the means for conveying them through a furnace. In this operation, the parts to be heat treated are pushed through two Holcroft gas-fired furnaces at a temperature of 1550 F.

A complicating factor is that differential hardnesses are required in the track shoes. The desired properties are 28 to 35 Rc in the body of the track shoe, and 38 to 44 Rc in the lug.

Channel-Shaped Rails Used

The problem was solved in the furnace by designing channel-shaped rails in which the largest size shoe can be placed and then pushed through the furnace. Smaller sizes are loaded on trays and fixtures that ride on the same rails. The shoes are made of types 1045 or 1050 steel. After the lug is hardened in water, the hardness required in the body of the shoe is achieved by oil quenching. Then the entire shoe is sent through a draw furnace at 750 F. By means of this series of operations, approximately 4000 lb per hr of track shoes are heat treated.

Holcroft engineers chose type HT alloy (35% Ni, 15% Cr) for the important parts. All of the trays used are cast of this alloy. In the furnace itself, the refractory piers are capped with type HT alloy castings, which serve as bearing plates for the channel-shaped rails, also made of type HT alloy castings. According to Holcroft, this alloy was chosen as the best available for the high temperatures and stresses involved.

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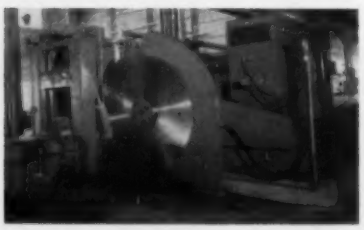
Cutting:

Large saw slices ingots almost 3½ ft thick.

An adjustable-speed drive is being used to power a 7 ft circular saw (claimed to be one of the largest ever manufactured) at a U. S. Air Force plant in Cleveland.



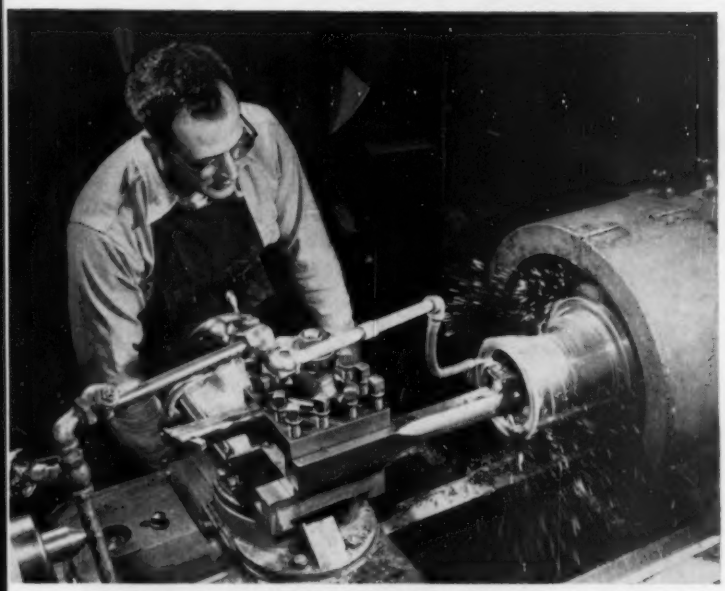
Seven ft circular saw cuts aluminum forging ingots.

Used to cut aluminum forging ingots, the huge blade rotates at speeds up to 46 mph. It can slice through aluminum ingots almost 3½ ft thick. Cutting the ingots to size is one of the first steps in the forging of wing spars for jet aircraft.

This Motch & Merryweather saw, capable of handling an 8½ ft. blade, is powered by a General Electric unit-cooled direct current motor. The unit-cooler is an

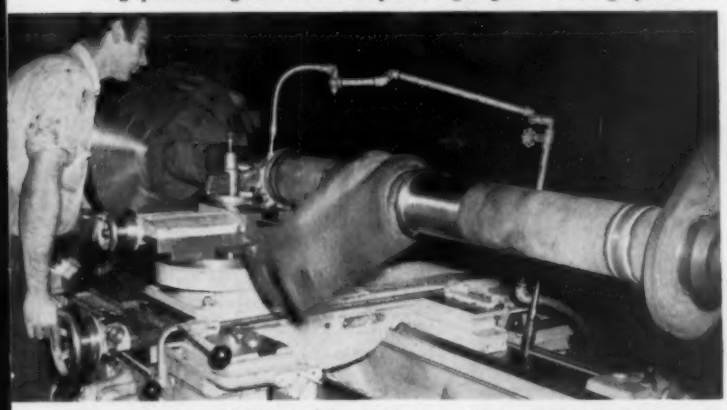
AXELSON production and maintenance news

AXELSON MANUFACTURING COMPANY / DIVISION OF U.S. INDUSTRIES, INC. / 6160 SOUTH BOYLE AVENUE, LOS ANGELES 58, CALIFORNIA



PRODUCTION. Heavy-interrupted roughing cuts are performed on the OD and ID of gear box support adapters on this 20" Axelson Heavy-Duty Lathe. Finishing operations include facing, turning and chamfering.

PRODUCTION PARTS. Cast steel parts for The Conveyor Company's mobile sweeper are turned, bored, faced and chamfered with carboloy tools using quick change tool block to speed roughing and finishing operations.



JOB SHOP MACHINING. 93" long axle assembly for hydraulic boom crane is rough and finish turned on this 32" Axelson Heavy-Duty Lathe, which has a 41½" swing and a 20' bed.

SWEEPER MANUFACTURER PUTS COMPLEX PARTS ON PRODUCTION BASIS...

maintains flexibility for job shop machining.

Street sweepers, conveyors, industrial scale equipment, vegetable packing machinery, batch and rock plants, are only a few examples of products manufactured by The Conveyor Company, Los Angeles, where machine tools require maximum flexibility and ruggedness combined with extreme accuracy to meet the wide range of possible applications.

Some of these products are on a production basis, such as street sweepers. Even these require maximum machine flexibility, since the sweepers have many complex and varied parts, which must be machined to close tolerances. Two typical production turning jobs are performed on 16" and 20" Axelson Heavy-Duty Lathes.

Gutter boom shaft housings, in 50-piece lots, are rough and finish turned, faced, chamfered and bored on the Axelson 16" lathe. Parts are cast steel 7½" diameter, 10" long. Accuracy is ±.002.

The 20" Axelson Heavy-Duty Lathe is used for production of cast steel gear box support adapters. Heavy, interrupted roughing cuts are performed on the OD and ID. Other operations include rough and finish facing, turning and chamfering. Parts are 6⅞" diameter, length 7½" and weigh 30 lbs. Accuracy is ±.002. Carboloy tooling is used for both applications.

A 32" Axelson Heavy-Duty Lathe with a 20' bed is used for turning large shafts and other heavy-duty parts for batch and rock plant applications.

For a complete description and detailed specifications on Axelson Tool Room, Medium-Duty and the new 25/16 and 32" Heavy-Duty Lathes: Write for bulletins I1-5507-5504.

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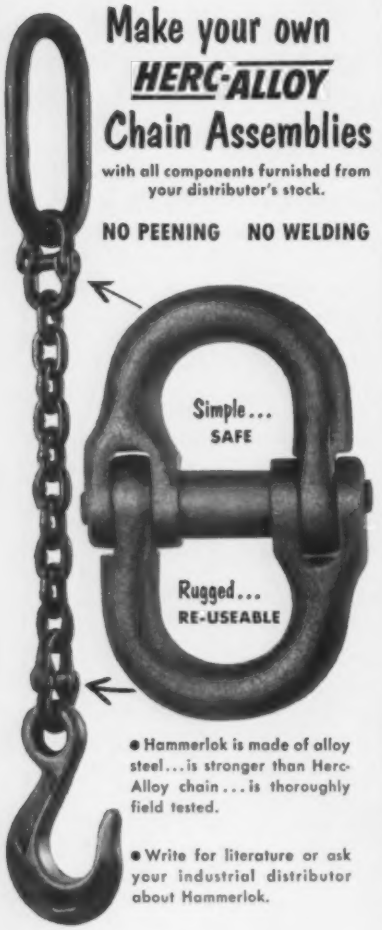
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integral part of the motor and, operating on a heat-exchanger principle much like the radiator on an automobile, protects the motor from metal dust thrown off by the whirling blade.

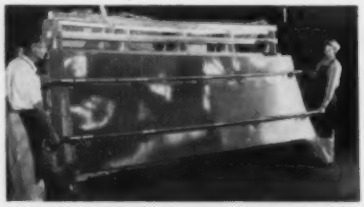
The variable-speed drive provides speed range from 1360 to 4100 sfpm. The wide range is required because of the various grades of aluminum placed before the giant saw. The different speeds needed had previously been obtained through gear changes.

The saw is located in a new plant operated for the Air Force by the Aluminum Company of America.

Methods:

Vacuum bars and cups used to transport sheet.

New material handling methods —using vacuum bars and cups— have been devised to protect the raw materials that are to be used in manufacturing the skin surfaces of aircraft. At the Fort Worth plant of the Convair Division of General Dynamics Corp.



Unwieldy aluminum sheet is easily moved with vacuum bars.

employees move a piece of unwieldy aluminum sheet stock by means of static vacuum bars. The vacuum cups are attached to aluminum bars and are applied to the metal sheet with hand pressure. Convair-Fort Worth is also planning other applications of vacuum to material handling. Overhead vacuum lifts, mechanical vacuum cups using vacuum pumps, and vacuum cups using compressed air in the Venturi principle are contemplated with the aim of protecting metal surfaces from scratches and nicks which would mean rejection by the manufacturing department.

Forgings:

Rings developed for dryers cut fabrication costs.

Floating steel tires—design features of Ruggles-Coles rotary dryers built by Hardinge Co., Inc., York, Pa. —· are reported to provide for heat expansion of large cylindrical dryer shells without strains and for economies in fabrication of the dryers.

Costs of fabrication are minimized by the fact that forge rolled and rough turned rings for this service are assembled as received from the Burnham, Pennsylvania, plant of Standard Steel Works Div. of Baldwin-Lima-Hamilton Corp. Dimensional tolerances are

Forge rolled and rough turned rings aid dryer fabrication.

liberal because the rings are assembled on the dryer shell by wedging a number of steel blocks under them at equal intervals around the shell. These wedge blocks are then welded to the shell with retainer blocks welded on alternate ends of the wedge blocks. A steel block is also welded on the inside of the rings before assembly to prevent rolling on the dryer shell.

SAE 1060 For Wear

Maximum wear is provided by the use of SAE 1060 steel which, through years of experience and the necessary care required to weld this type steel, Hardinge has been able to use advantageously.

Although the elimination of machining operations is one of the two principal advantages derived from the use of forged rings for

the dryer tires, the flawless metal of an endless steel forged ring is also reported as an advantageous quality in fabrication and in assuring trouble-free, heavy-duty service in the operation of the dryers. Forged rings up to 9 ft in diameter, with 12-in. face and 6¾-in. thickness are also obtained.

Machining:

High speed spindle mounting holds bearing adjustment

A solution to the problem of spindle heat and high spindle speeds which cause radial expansion as well as axial has been announced by Timken Co. engineers. Their specific interest was the fact that on a spindle with the bearings mounted cone adjusted, a given distance apart, the bearings expanded radially and tended to tighten more rapidly than the spindle expanded axially loosening the bearing adjustment.

Time Interval Needed

In order to take care of the short period of time during which the radial and axial expansions took place, it was necessary to give the bearings on the spindle a chance to breathe or expand radially and thus prevent the excessive preload which might develop. The period of time is that between the time of starting the machine and the time it gets up to operating temperature.

Clearance Taken Up

Timken laboratories proposed the use of the high-speed spindle mounting where the front bearing is mounted on the spindle and directly in the headstock of the machine. The rear bearing cup is mounted in an adaptor.

In operation, as the bearing temperature rises, the rear bearing and adaptor expand radially taking up the slight clearance between the adaptor and the headstock bore. In so doing, both front and rear bearings are relieved from extreme preload and consequently failures due to excessive tightness and temperature are eliminated.

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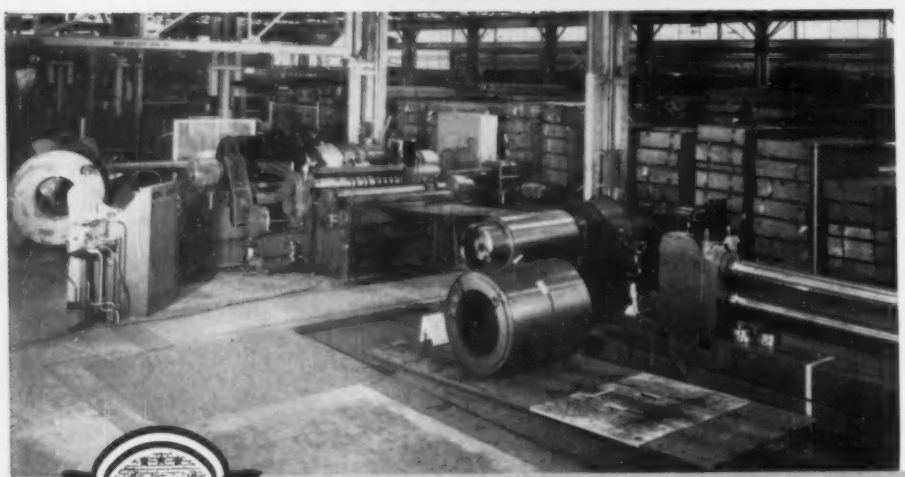
View shows coil lift and traverse, coil pay off reel, coil loading ramp and detachable slitter head.



Overall view of coiling line from entrance end.

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STAMCO, Inc., New Bremen, Ohio

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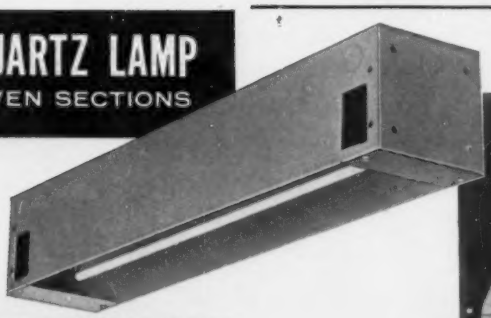
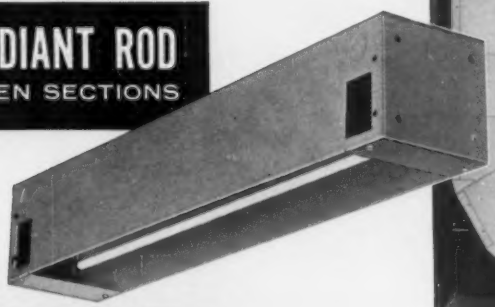
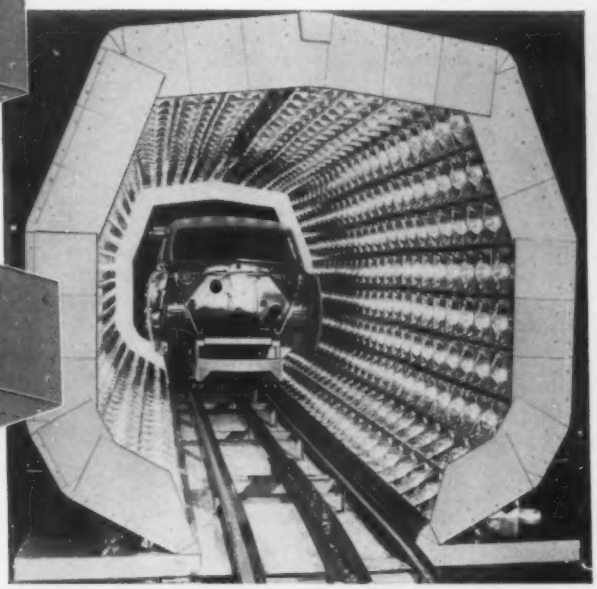


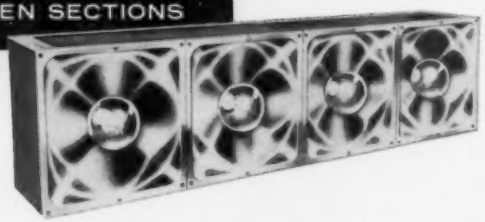
2 RADIANT ROD OVEN SECTIONS





Fostoria Complete Radiant Ovens

3 INFRARED LAMP OVEN SECTIONS



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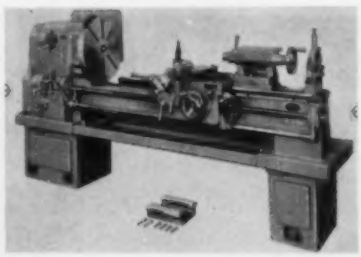
NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 89 or 90

Bed lathes accommodate oversize workpieces

A new line of all-geared head, fixed gap bed lathes in 15, 18, 21½ and 26 in. sizes are designed to provide extra versatility since oversized workpieces may be accommodated by removal of the gap block. This increases the swing size to 22, 27, 32 and 37 in. respectively. The lathes have 12 spindle speeds in geometric progression, with a 3-lever, color-match, direct-reading shift mechanism. The spindle is mounted in three precision antifriction bearings. All headstock bearings are pressure lubricated with filtered oil. *Cincinnati Lathe and Tool Co.*

For more data circle No. 30 on postcard, p. 89.



Gaging fixture checks shoulder squareness

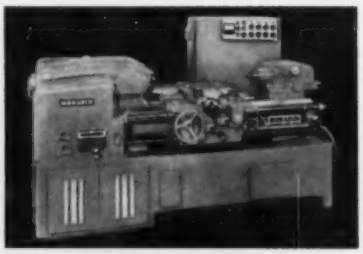
A new gaging fixture—developed to fill requests for an accurate, positive means of checking shoulder squareness to the centerline of product threads—has been announced. Using readily interchangeable roll holding plates and interchangeable gaging rolls, the fixture provides an inspection range from ¼ to 1½ in. thread diam. Used with an ordinary dial indicator, the fixture consists of a gaging head mounted on a precision aligned spindle. Accuracy is approx. 0.0002 in. total indicator reading at 1½ in. diam. *Pratt & Whitney Co.*

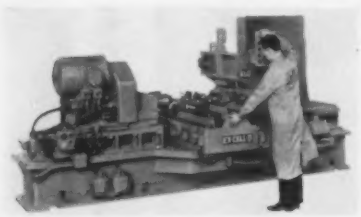
For more data circle No. 31 on postcard, p. 89.

Preselector control offered for turning lathe

Now available is a new electrical preselector control for a precision turning lathe which provides automatic motor speed change and gear selection for up to five different cutting conditions. Functioning in conjunction with the lathe's regular all electric motor speed control and hydraulic gear shifting mechanisms, the preselector control enables a reduction in machining time and less effort on any work run involving two or more duplicate pieces. *Monarch Machine Tool Co.*

For more data circle No. 32 on postcard, p. 89.





Machine provides faster crankshaft machining

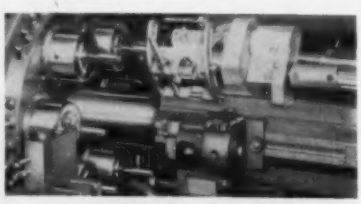
Performing triple operations simultaneously on two crankshafts, a special machine is arranged to receive and discharge workpieces by conveyors for less handling and increased output. Operations on the crankshafts include finish boring a diameter within limits of plus or minus 0.0005 in. and holding the bore concentric with the main bearings; facing a surface and chamfering an edge. *Ex-Cell-O Corp.*

For more data circle No. 33 on postcard, p. 89.

Screw machine attachment simplifies milling

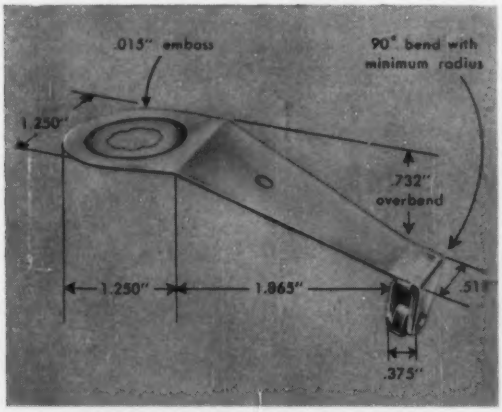
An attachment for multiple-spindled automatic screw machines, called the turnmill, is designed to eliminate secondary operations. Available for every size and make of multiple-spindled automatic screw machine now in use, the attachment permits milling any number of flats or slots while the part is turning in the spindle. *Turnmill, Inc.*

For more data circle No. 34 on postcard, p. 89.



This railroad runs better, will last longer

A Type ZW Lionel Trainmaster Control has four independent variable voltage circuits, can operate four trains simultaneously.



One of the four variable voltage taps in a Type ZW Lionel Trainmaster Control, now made of .0150" thick Duraflex in spring temper. This temper in Duraflex provides the extra strength needed—with the same forming properties as conventional phosphor bronze in extra hard temper.

Lionel switched to DURAFLEX for the hardest working parts of its Trainmaster controls

Much of the fun of model railroading depends on the smooth, dependable performance of its controls. That's why Lionel makes its Trainmaster controls tough, precision instruments – constantly guards their quality.

Lionel had been using an ordinary phosphor bronze in the vital, hard-working variable voltage taps. But they were troubled with fractures in forming the bends. To maintain their quality standards, they considered using another alloy, at substantially increased cost.

First, however, they tried Duraflex*, Anaconda's new superfine-grain phosphor bronze. The fractures were eliminated. The press room found the forming qualities of Duraflex excellent. The Transformer Department was pleased with the reduction in rejects, found the strength and resilience better.

So Lionel has controls of superior quality – at no extra cost – for Duraflex costs no more than ordinary phosphor bronze.

Duraflex, because of its superfine-grain structure, offers greatly improved fatigue resistance and formability. It also has a finer, smoother, harder surface, plus good electrical conducting properties and high corrosion resistance. It is produced in sheet metal up to 0.062" thick and in wire up to 3/16" diameter. We will provide free samples for test purposes – specify gage and temper. Write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 6666

*Trade Mark

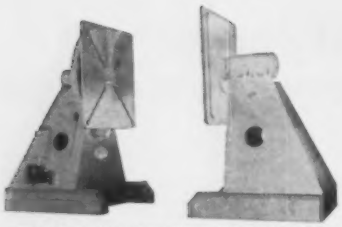
DURAFLEX

The New Superfine-Grain Phosphor Bronze

with 30% Greater Endurance Limit

an ANACONDA® product

Positioners useful in handling bulky objects



HEAD & TAIL STOCK POSITIONERS

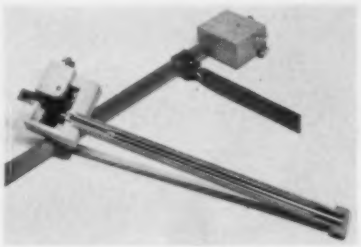
A new line of head and tail stock positioners are recommended for use on large bulky objects such as trailer frames, tank hulls, and other such weldments where it is necessary to rotate the object around a fixed axis for automatic welding, inspection or painting. The units are built in pairs, one consisting of a constant speed, motor-driven head stock while the other consists of an idling type tail stock. Available in sizes from 5000 to 32,000 lb capacity. *Webb Corp.*

For more data circle No. 35 on postcard, p. 89.

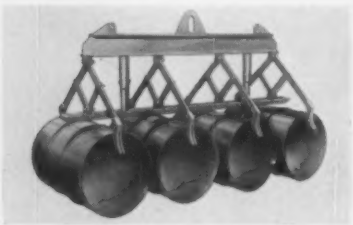
New principle employed on plating regulator

A new temperature regulator for plating baths is reported to incorporate a more efficient method of regulation. Constructed of an acid-proof, temperature-sensitive thermoplastic material, the unit utilizes the expanding and contracting properties of this material (a thermal conducting medium) for control. It automatically regulates the operation of heating or cooling sources to a temperature tolerance of within plus or minus one degree in a constant solution level. *Elkhart Controls Co.*

For more data circle No. 36 on postcard, p. 89.



Drum lifter handles three to six drums at a time



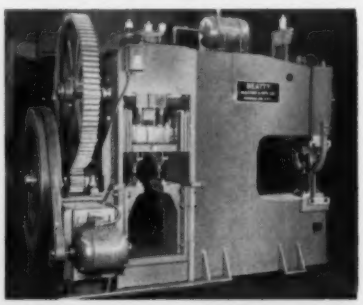
A new, automatic horizontal drum grab accommodates from three to six drums with each lift, making the handling and storing of drums a fast, easy job. To pick up a load, the grab is spotted over the drums and lowered until hooks engage the drum ends. To release the drums, the grab is lowered until the center bar forces the hooks open. A short end movement of the grab moves the hooks so the drum lifter may be hoisted clear of the drums. One hoist operator handles whole job. *Downs Crane & Hoist Co.*

For more data circle No. 37 on postcard, p. 89.

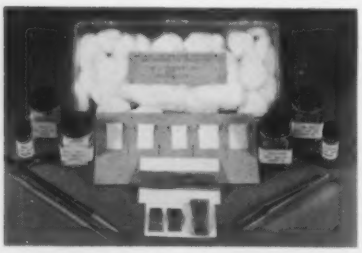
Beam punch facilitates single-hole punching

Designed to simplify single-hole punching, a new detail beam punch is reported to accomplish the punching of I-beams in three passes instead of five and eliminate the end-for-end turning of beams. The unit is of 100 ton capacity, mechanically driven, and will punch up to a 1¼ in. hole through 1 in. material. Guillotine portion provides two overhanging bolsters with punch tools for punching holes in flanges on either side of the webs of beams. Flange punch tools are arranged so that, when moved, small beams can be punched while heavier beams are punched further back. *Beatty Machine & Mfg. Co.*

For more data circle No. 38 on postcard, p. 89.



Strain gages for temperature checks to 1800°F



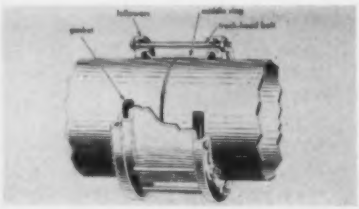
New, patented SR-4 resistance type strain gages for use at temperatures up to 1800°F are announced. Offered for experimental use without guarantees, the units are available in kits including ten gages, four types of cement with different temperature limits, detailed instructions for use, and tools to simplify application. Temperature limits of the four cements are 700°, 900°, 1100° and 1800°F. Nominal resistance of the gages is between 97 and 120 ohms. *Baldwin-Lima-Hamilton Corp.*

For more data circle No. 39 on postcard, p. 89.

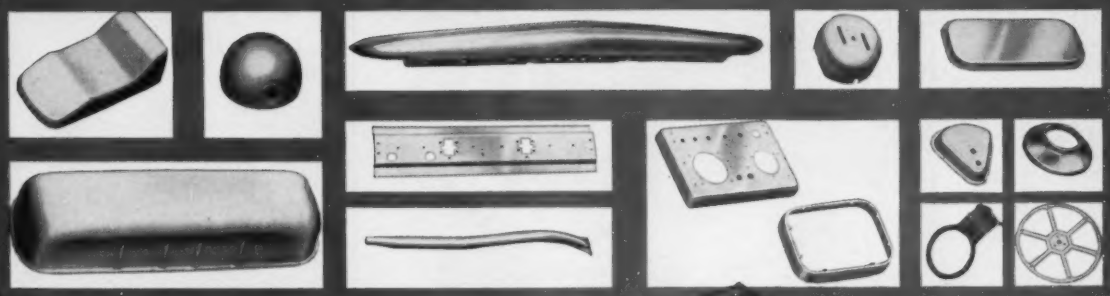
Simplified coupling method used on piping

A company line of abrasion-resistant metal piping is available for use in hydraulic or pneumatic materials handling systems. The piping is said to offer advantages of (1) high resistance to wearing action of abrasive materials, (2) uniform composition of pipe, (3) true dimension of pipe diam and wall thickness, and (4) simplified coupling. *Allen-Sherman-Hoff Co.*

For more data circle No. 40 on postcard, p. 89.



if you use or sell parts like these...

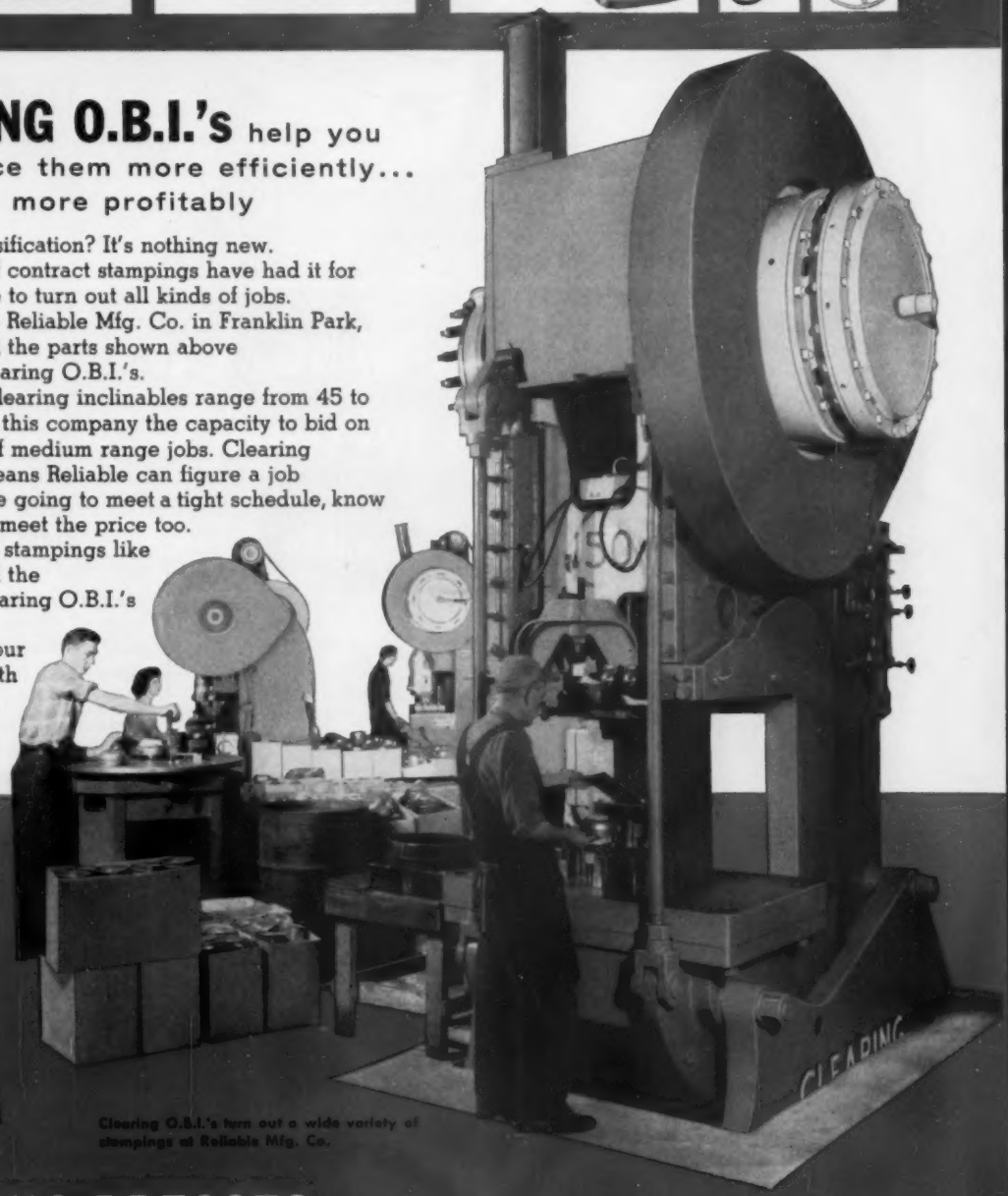


CLEARING O.B.I.'s help you produce them more efficiently... sell them more profitably

Talk about diversification? It's nothing new. Manufacturers of contract stampings have had it for years. They have to turn out all kinds of jobs. For example, the Reliable Mfg. Co. in Franklin Park, Illinois produced the parts shown above on their four Clearing O.B.I.'s.

Reliable's Clearing inclinables range from 45 to 150 tons, giving this company the capacity to bid on a great variety of medium range jobs. Clearing dependability means Reliable can figure a job and know they're going to meet a tight schedule, know they're going to meet the price too.

If you make stampings like these, you'll find the efficiency of Clearing O.B.I.'s pays off in the clinches. Talk your problem over with a Clearing sales engineer. Call us today.



Clearing O.B.I.'s turn out a wide variety of stampings at Reliable Mfg. Co.

Write for new Clearing booklet—"Thinking about a better way to do the job."

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION *division of U. S. INDUSTRIES, INC.*

6499 West 65th Street, Chicago 38, Illinois • Hamilton Plant, Hamilton, Ohio

"We better get our order off for inventory build up of OILDIE or it won't be a Happy New Year for Pete!"

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS

Ruthman Gusher Coolant Pumps Are Adaptable

Illustrated is a Gusher Coolant Pump mounted on Beco Model #410 Automatic Drilling and Tapping Machine.

Photo Courtesy Batchelder Eng. Co., Inc.

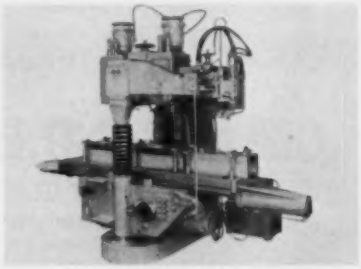
Gusher Coolant Pumps readily lend themselves to novel and unusual applications. On the Beco Model #410 automatic drilling and tapping machine, the Gusher Coolant Pump is mounted on roller drawer slides for quick and easy exchange of coolants. On all coolant pump problems you can depend on Gusher Coolant Pumps.

THE RUTHMAN MACHINERY CO.

1809-1823 Reading Rd. **Cincinnati 2, Ohio**

Die sinking machines

A line of completely automatic hydrocopy die sinking machines is being introduced in this country. Six different models are provided for one, two, four or six-spindle machines. A two-spindle model (illustrated) is typical of the line. It has the tracer head rigidly connected to the milling head to elimi-

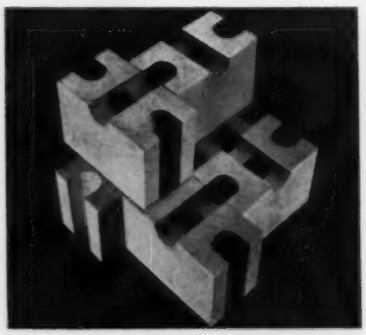


nate any movement error between the two heads. This unit and others in the line are designed to copy workpieces from masters to a normal working accuracy of ±0.002 in. with closer tolerances capable of being maintained. *Cosa Corp.*

For more data circle No. 41 on postcard, p. 89.

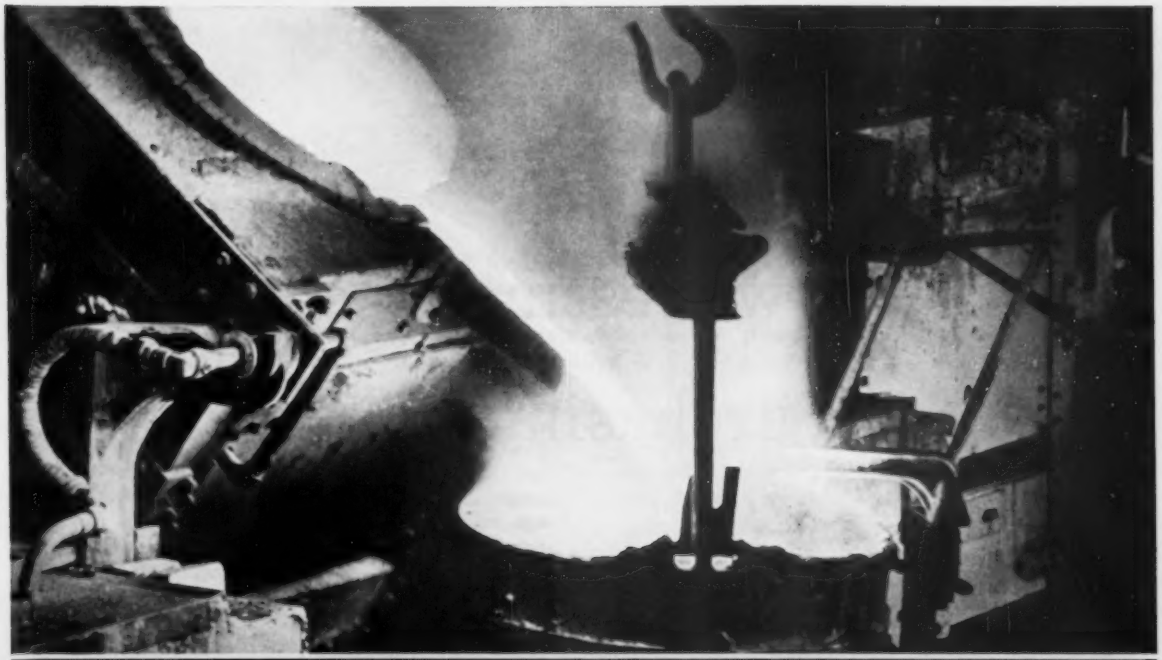
Blast furnace checker

Reported as providing 25 to 50 pct greater heating surface, a new type of checker shape for lining and relining blast furnace hot stoves has been introduced. Produced in two styles, one with a cross flue feature and the other without cross flue, the unit pro-



vides a solid 1¼ in. wall between each flue. Increased heating surface provided by this checker results in a correspondingly lower stack temperature, the manufacturer reports. *William M. Bailey Co.*

For more data circle No. 42 on postcard, p. 89.



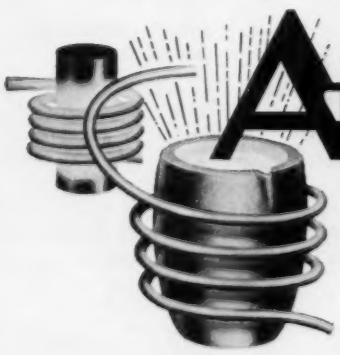
6 tons of steel melted and poured every 2½ hours

SPEED . . . CONTROLLED QUALITY . . . ECONOMY —these advantages are enjoyed on every melt, ferrous or non-ferrous, in Ajax-Northrup induction furnaces. This furnace for example, turns out a six-ton charge of nickel alloy—precisely alloyed and virtually free of impurities—every 2½ hours.

Ajax induction melting puts substantially all the heat in the charge proper. No power is wasted in superheating crucible or refractory, and little heat escapes into the room. Speed of melting and electromagnetic stirring insure perfect alloys every time.

Ajax has been building induction furnaces for all metals since 1916. Installations capable of producing up to 20,000 pounds of metal per hour are in operation, and more and more foundries are switching to Ajax-Northrup melting as they discover its economy and advantages. Learn why in Bulletin 27-B, available upon request to Ajax Electrothermic Corporation, Trenton 5, New Jersey.

Associated Companies: Ajax Electric Company—Ajax Electric Furnace Co.—Ajax Engineering Corp.



AJAX NORTHRUP SINCE 1916

INDUCTION HEATING-MELTING

New Westinghouse Purchasing Plan

Helpful to both buyer and seller

The Purchasing Department of Westinghouse Electric Corporation has initiated a new purchasing program. Through a plan called Operation Co-operation they are developing an open door policy to encourage suppliers to meet with their engineers and others in an effort to learn more about Westinghouse products and methods.

In this way it is expected that suppliers' sales representatives and engineers may be in a better position to help. By giving suppliers every encouragement to ask questions, study shop operations, products, processes, etc., Westinghouse believes its own profits can be increased.

We congratulate the Westinghouse Purchasing Department on this progressive step and are convinced that it will not only build goodwill but will also prove practical and profitable for their good company. It is realized, of course, that many other companies operate along similar lines but this formalizing of the program by a leading purchasing department is of interest and presents a strong challenge to all suppliers to make good on every contact.

We are glad to report that our own Purchasing Department is taking a page from the Westinghouse book and is following very much the same procedure. We are also glad to report that it has always been the Ryerson policy to have our representatives go through years of training within our own organization before going into the field, so that they are well qualified on all steel products and problems.

So, again we congratulate the Westinghouse Purchasing Department and others who have similar programs because we are confident that manufacturing costs will be reduced, products improved and buying and selling costs cut. In total, we believe that our American economy will benefit by "Operation Co-operation".

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age SUMMARY . . .

Steel market may hold a few surprises in weeks ahead . . . Auto cutbacks not yet felt in steel . . . Cancelled tonnages snapped up by hungry consumers.

Don't Be Fooled . . . Watch out for a few more surprises in the steel market. Talk of a letdown is based more on wishful thinking and speculation than actual fact. While some consumers claim their supply position has eased, others complain of paying gray market prices.

The cutbacks in automotive production are real. But in terms of steel order cancellations, the effect is far from encouraging in the overall outlook for steel supply. There have been some small cancellations—mostly in sheet and strip—for March.

Meanwhile, a steel user in the Pittsburgh area takes time out to cite chapter and verse on prices he is paying for some of his requirements—as much as $105 above mill price for plates, and $98.50 above mill price for hot-rolled sheets. These prices are charged by so-called "outside" sources. So far, any tonnages released through cancellation have been snapped up by hat-in-hand consumers whose inventory position has been far from adequate. There's a home for every ton of steel the mills can turn out.

Things To Watch . . . The automotive market may have a few surprises up its sleeve, too. No one knows for sure how long the present lethargy of the car-buying public will last.

Here are a few other facts to consider: (1) construction will be coming back strong as winter eases, (2) appliance production is moving along at top speed, with no sign of a letdown, (3) the record freight-car building program is barely under way, and (4) oil and gas industries are taking all the steel they can get.

The prospect of higher steel prices and the uncertain outlook on steel labor also will work to sustain demand, at least through first half of the year, at capacity levels.

Another tip-off that steel supply is far from easier is that warehouse demand continues strong. Many consumers have been relying on spot tonnages from warehouses to keep inventories in some sort of balance. One warehouse reports only four cancellations since Jan. 1 and these were due to slow delivery schedules of the warehouse.

Mills Pushing Hard . . . One bright spot in the outlook is ability of steel companies to maintain a high production level. The mills are throwing everything they have into the battle to catch up with delivery promises. The all-out effort is keeping ingot output at near-capacity levels.

Production this week is scheduled at 98 pct of capacity, off from last week's 98.6 pct.

Steel Output, Operating Rates

	This Week	Last Week	Month Ago	Year Ago
Production (Net tons, 000 omitted)	2,412	2,428	2,425	2,052
Ingot Index (1947-1949=100)	149.9	151.1	150.7	128.2
Operating Rates				
Chicago	97.5	97.5	98.0	87.0
Pittsburgh	101.0	102.0*	103.0	82.0
Philadelphia	100.5	104.0	105.0	84.0
Valley	98.0	99.0*	99.0	85.0
West	103.5	101.0*	101.5	88.0
Detroit	103.0	103.0*	101.0	89.0
Buffalo	105.0	105.0	105.0	100.0
Cleveland	101.0	100.0*	100.0	83.0
Birmingham	96.0	95.0	94.5	79.0
S. Ohio River	88.0	89.0	90.0	95.5
Wheeling	100.0	96.0*	107.0	98.0
St. Louis	99.0	99.0	107.0	89.0
Northeast	80.0	82.0	88.5	50.5
Aggregate	98.0	98.6	100.5	85.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.797
Pig Iron (Gross Ton)	$59.09	$59.09	$59.09	$56.59
Scrap, No. 1 hvy (gross ton)	$53.17	$53.67	$52.17	$34.50
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	23.20
Copper, electrolytic	43.00	43.00	43.00	30.00
Lead, St. Louis	15.80	16.30	15.30	14.80
Magnesium	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	104.50	107.00	110.00	86.75
Zinc, E. St. Louis	13.00	13.50	13.00	11.50

No Easing In Sheet Deliveries

Despite mounting consumer hopes of an easing in sheets, they're just hopes . . . Demand for sheet, strip is still very heavy . . . U. S. Steel relights furnace.

◆ DESPITE MOUNTING HOPE among some consumers that the squeeze on sheet and strip may show signs of easing, the situation is still one of hope rather than fact.

Customer demand for both products continues to run full tilt. Even where mills have had some open capacity on cold-rolled sheets, the situation hasn't helped hard-pressed customers very much.

One Cleveland mill, for example, had about 3000 tons open capacity on cold-rolled sheets for March, but this was snapped up by waiting consumers. In this instance, reports of the producer's open sheet capacity triggered wide rumors of a loosening in the sheet market due to a drop in automotive demand. In effect, the rumors amounted to more than the steel involved.

In the same vein, there are indications that some sheet mills may consider rolling a little more light plate should it be necessary to take up any slack. But this is not likely as long as sheet demand continues strong.

All 28 of U. S. Steel Corp.'s Mon-Valley blast furnaces are back in operation following the lighting up of No. 5 furnace at Duquesne Works.

Normally, one or more of the furnaces are out of production for relining, pointing up the Corporation's all-out efforts toward meeting the unprecedented demand for steel products.

Dominion Foundries & Steel Ltd., Hamilton, Ont., has increased prices on two products. Hot-rolled steel plate was moved up from $4.85 to $5.35 per cwt. And, hot-rolled steel sheet was upped from $4.50 to $4.75 per cwt.

The firm says the price changes are necessary owing to the increase in the price of steel scrap, which is $15 a ton higher than a year ago.

Detroit Steel Corp. has made two changes in the base price per cwt on hot-rolled rods and low carbon basic wire.

Hot-rolled rods have a new base price of $5.375 per cwt, f.o.b. Portsmouth, O., and low carbon basic wire is now priced at $6.60 per cwt, same f.o.b. point.

It was originally estimated that downtime for The Mystic Iron Works blast furnace would be about 4 mos. It's now expected the work will take around 6 to 7 mos.

SHEETS AND STRIP . . . Rumors of some easing in availability continue to be heard. In **Detroit**, there has been a slight letup from auto companies for sheet. Some firms are cancelling small tonnages for March, but these are being snapped up quickly by other customers. Balancing inventories is a major reason behind auto producers' momentary letup in some sheet tonnage requirements. A large **eastern** producer still has hopes of becoming current on sheet and strip deliveries by March. Heavy carryovers from fourth quarter, coupled with a rigid allotment on both products for first quarter '56 are cited as reasons for optimism. A **Cleveland** mill has just opened second quarter order books informally on allocation. There are also reports that a large mill in the **East** has rolling time available on cold-rolled sheets for March due to cutbacks in production by several big consumers. **Chicago** consumers expect little letup in heavy sheet and strip demands. There are strong hopes, however, that delivery carryovers will be wiped out in the first quarter. This indicates that smaller customers may get some relief after March.

GALVANIZED . . . Big consumers in the **mid-west** are reportedly pushing hard already for quicker deliveries of their quota material. This, despite the fact that they and the warehouses have been steadily building inventory for some months past.

BARS . . . A mild easing in customer demand is reported from **Chicago.** Letup is mainly from smaller consumers. Farm equipment manufacturers are pushing hard for all the hot-rolled bar they can get. Cold-finished bar is strong in this market. Mill order books on hot-rolled bar are solid through the first half. Consumer bar supplies in **Detroit** are still relatively tight compared to other products. One producer in the area has opened order books for alloy bars in second quarter, but these will continue to be on an allocation basis. A large **eastern** producer hopes to be current on all bar deliveries by March. Heavy construction activity on the **West Coast** is putting a heavy demand for all types of bars on local producers.

PLATE . . . Consumer demand for both heavy and light plate in the East continues to exceed production capacities. So far, producers report there's little indication of any sizable gray market or conversion deals in the area. Plate deliveries in **Pittsburgh** still run 10 to 12 weeks behind producers' promises. Line pipe fabricators already have their fingers on a good portion of plate output. Likewise, the railroads are expected to get increased plate tonnage, especially after first quarter. Plate is still one of the tightest products to get hold of in **Detroit.** Little easing in demand is expected for months to come. In **Cleveland,** things are so tight that warehouses are currently living off railroad cars.

STRUCTURALS . . . If you're not on a mill order book in **Pittsburgh,** it's almost impossible to get any structurals in this district. Warehouse stocks are down to the bare cement, and even premium prices aren't the answer to meeting customer demand.

Purchasing Agent's Checklist

INDUSTRY: Vulnerability of concentration means dispersal is vital ..... p. 27
COMMERCE: Barge boom marks move to waterfront ..... p. 30
GOV'T: U.S. spending will rise by $2 billion in fiscal '57 ..... p. 33
TECHNICAL: Here's how contract stampers choose a press .... p. 67

Comparison of Prices

(Effective Jan. 17, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Jan. 17 1956	Jan. 10 1956	Dec. 21 1956	Jan. 18 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled Sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.79
Plate	4.52	4.52	4.52	4.225
Plates, wrought iron	10.40	10.40	10.40	9.30
Stain'l's C-R strip (No. 302)	44.50	44.50	44.50	42.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$9.05
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.75
Special coated mfg. ternes	7.85	7.85	7.85	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.30¢
Cold finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.45
Light rails	5.65	5.65	5.65	5.35
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$64.00
Slabs, rerolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.797¢

	Jan. 17 1956	Jan. 10 1956	Dec. 21 1956	Jan. 18 1955
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$63.69	$63.69	$63.69	$61.19
Foundry, Valley	59.00	59.00	59.00	56.50
Foundry, Southern, Cin'ti	62.93	62.93	62.93	60.43
Foundry, Birmingham	55.00	55.00	55.00	52.88
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia.	62.77	62.77	62.77	60.27
Basic, Valley furnace	58.50	58.50	58.50	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74.76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig Iron	$59.09	$59.09	$59.09	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$54.50	$54.50*	$53.50	$36.50
No. 1 steel, Phila. aren	55.50	55.50	51.50	32.00
No. 1 steel, Chicago	*49.50*	51.00	51.50	34.50
No. 1 bundles, Detroit	47.50	47.50*	45.50	27.50
Low phos., Youngstown	*56.50*	59.50	55.00	36.50
No. 1 mach'y cast, Pittsburgh	55.50	55.50	54.50	43.50
No. 1 mach'y cast, Philadel'a	57.50	57.50	56.50	42.00
No. 1 mach'y cast, Chicago	*55.00*	56.50	56.50	45.00
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$53.17*	$53.67	$52.17	$34.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.38
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	43.00	30.00
Copper, Lake, Conn.	43.00	43.00	43.00	30.00
Tin, Straits, New York	*104.50*†	107.00	110.00	86.75
Zinc, East St. Louis	13.50	13.50	13.00	11.50
Lead, St. Louis	*15.80*	16.30	15.30	14.80
Aluminum, virgin ingot	24.40	24.40	24.40	23.20
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	33.25	33.25	33.25	27.75
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	60.50	61.00	61.50	62.00	.....
Birdsboro, Pa. *B6*	60.50	61.00	61.50	62.00	.....
Birmingham *R3*	54.50	55.00*	.....	.....	.....
Birmingham *W9*	54.50	55.00*	59.00	.....	.....
Birmingham *U4*	54.50	55.00*	59.00	.....	.....
Buffalo *R3*	58.50	59.00	59.50	.....	.....
Buffalo *H1*	58.50	59.00	59.50	.....	.....
Buffalo *W6*	58.50	59.00	59.50	60.00	.....
Chester *C17*	60.50	61.00	61.50	.....	.....
Chicago *I4*	58.50	59.00	59.00	59.50	.....
Cleveland *A5*	58.50	59.00	59.00	59.50	63.50
Cleveland *R3*	58.50	59.00	59.00	.....	.....
Duluth *I4*	58.50	59.00	59.00	59.50	.....
Erie *I4*	58.50	59.00	59.00	59.50	.....
Everett *M6*	.....	62.50	63.00	.....	.....
Fontana *K1*	64.50	65.00	.....	.....	.....
Geneva, Utah *C7*	58.50	59.00	.....	.....	.....
Granite City *G2*	60.40	60.90	61.40	.....	.....
Hubbard *Y1*	.....	.....	59.00	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Minnequa *C6*	60.50	61.00	61.50	.....	.....
Monessen *P6*	58.50	.....	.....	.....	.....
Neville Is. *P4*	58.50	59.00	59.00	.....	.....
N. Tonawanda *T1*	.....	59.00	59.50	.....	.....
Pittsburgh *U1*	58.50	.....	.....	59.50	.....
Sharpsville *S3*	58.50	59.00	59.00	59.50	.....
So. Chicago *R3*	58.50	.....	59.00	.....	.....
Steelton *B3*	60.50	61.00	61.50	62.00	66.50
Swedeland *A2*	60.50	61.00	61.50	62.00	.....
Toledo *I4*	58.50	59.00	59.00	59.50	.....
Troy, N. Y. *R3*	60.50	61.00	61.50	62.00	66.50
Youngstown *Y1*	.....	.....	59.00	59.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. *Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron Buffalo, *HI*, $68.75; Jackson, *JI*, *GI*, $67.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

←To identify producers, see Key on P. 136→

Product	301	302	303	304	316	321	348	410	416	430
Ingots, rerolling	17.75	19.00	—	20.25	31.50	25.00	33.75	15.00	—	15.25
Slabs, billets, rerolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	32.25	32.25
Sheets	44.25	44.50	52.25	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	50.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Garv, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Philadelphia, *D5.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6.*

Bar: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5;* Ft. Wayne, *I4;* Philadelphia, *D5;* Detroit, *R5.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown; *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Philadelphia, *D5*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forgings billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3,* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5.*

Prices Dip In Some Markets

Top steelmaking grades take price dip in Chicago, Cleveland, the Valley . . . Pittsburgh and the East hold firm, other districts unchanged . . . Composite drops 50¢.

◆ PRICES BROKE in Chicago, Cleveland, and the Valley this week as the market reacted from a steady upward trend which raised quotations to record-breaking levels.

Pittsburgh and Philadelphia held firm on the top grades, and secondary material in Pittsburgh brought higher prices.

The weakness in Chicago and the Valley was based on sales. Cleveland was off in sympathy. Steelmaking grades were down $2 in these districts.

Elsewhere, prices held unchanged. But some fear was expressed that weakness in some areas might spread. No one was able to say whether the break foreshadowed a downward trend or whether the softening was only temporary.

Mills have been trying for weeks to halt the upward spiral. It was believed that the combination of higher prices and resulting heavy influx of material from scrap generating sources plus high-level operation of blast furnaces may have been enough to level the market.

On the basis of the Chicago downturn, THE IRON AGE steel scrap composite price declined 50¢ to $53.17.

Pittsburgh . . . A large independent mill purchased a substantial tonnage of No. 2 heavy melting and No. 2 bundles. The local price was $48 and $45 respectively, but a $2 springboard was established on "out of district" scrap with over a $3 freight rate. While it has been established that a good portion of the purchase is at local prices, at least as much scrap carried the higher "out of district" prices of $50 for No. 2 hvy. melting and $47 for No. 2 bundles. Other grades remained firm or stronger with heavy turnings up $2 a ton and cupola cast being quoted at $50.

Chicago . . . Chicago scrap began finally to slip last week as increasing tonnages of scrap began moving at the bottom of the previous price range. At the same time, a mill in the area purchased at reduced prices and scrap moved in fair volume on the new orders. Broker buying sagged even more sharply with $48 being offered for No. 1 dealer bundles, $38 offered on No. 2 dealer bundles, and turnings going begging.

Philadelphia . . . The market continues steady and firm with steelmaking grades holding to previous levels. A scattering of stronger prices is reflected in some grades which include clean cast chemical borings, low phos 5 ft and under, railroad specialties, heavy turnings, and malleable. Dealers and brokers report that current congestion at the export level is rapidly being cleaned up which may preclude some additional strength in the domestic picture later on.

New York . . . This market remains stable with no changes reported at press time. However, many in the trade fear that price softening in other areas may spread to this area in the near future. But continuing strong export demand should still be a good buffer against sharp declines.

Detroit . . . The demand for scrap tapered off this week but the market reflected a firm tone. Sale of an additional tonnage of foundry steel by one of the big three automakers brought price of $1 to $3 lower from previous sales at the first of the month.

Cleveland . . . Based on a sale, steelmaking grades in the Valley dropped $2 a ton. Cleveland prices dropped $2 a ton in sympathy. Another indication of declining prices is reflected in one electric furnace mill's being offered tonnage for $57 the day after it bought similar grade tonnage for $60. Shortrails and cast rose $1 in Cleveland based on small foundry buys.

Birmingham . . . Although there have been no changes in prices, the steel scrap market is showing signs of weakness. Sellers are showing an increased willingness to sell at the present market, while buyers do not seem anxious to buy and have declined to purchase some specialty items at quoted prices. The largest buyer in the district is still holding up shipments on purchases made just before the year-end.

St. Louis . . . Scrap buying prices were off from $1 to $4 per ton in the St. Louis market, and approximately back to where they were before the previous advance, which had the effect of bringing a heavy volume of offerings. The freer flow of scrap exceeded the melt, which caused mills to reduce prices to slow the movement. Foundry grades were also off for the same reason. Another factor is that weather conditions continue good for collection and processing of scrap.

Cincinnati . . . With a local mill making only a token buy, and Pittsburgh and upriver demand nil, Cincinnati market dropped $2 on steelmaking grades. Local token buy was $50 delivered for No. 1 steel and $44 for No. 2 steel. Area and upriver mills dropped out of market late in the week giving no indication as to future buying. Small tonnage of straight turnings were sold at $33 delivered on fringe of area including $2.50 freight from Cincinnati while quoted alloy free are going for $1-2 higher in town with dealers searching for markets.

Buffalo . . . Scrap prices remain unchanged as the market continues strong in this area. No big purchases are expected during the remainder of the month.

Boston . . . Market continues to show good activity with most prices holding. Only mixed cupola cast moved up and brokers saw signs of a leveling off after weeks of steadily rising prices. Eastern Pennsylvania mills continue active. Export is strong.

West Coast . . . Scrap flow is good in all major areas. Dealers and mills are buying large amounts. Export activity has quieted some.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING

Sir Henry Bessemer

Bessemer Converters in use about eighty years ago . . .
This is the twelfth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.

1856
Bessemer Converter

So far as historians are concerned, the steel period began in 1856 with the adoption of the Bessemer process. While modern day scientists identify it as the Bessemer process, it was not the invention of one man. William Kelly, who will be introduced later in this series, is actually credited with the first principle of the pneumatic process.

The original idea of the converter was not to make steel directly but to convert cast iron into wrought iron, then into steel. Bessemer succeeded in producing steel by developing a pneumatic process of refining by blowing air through the molten iron. The success of the process depended on stopping the air blast before all the carbon was eliminated from the metal or on adding the necessary carbon to the metal after it was blown.

However, ironmasters who first used the process experienced both success and failure. The difference was in the composition of ores, a defection that was later corrected after proper chemical analysis.

Today, the most selective grades of scrap help produce America's finest steel. These special steels require scrap of known analysis. We believe our experience, personnel, equipment, and the strategic location of our offices can best help you solve any problem you may have in iron or steel scrap.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap Prices *(Effective Jan. 17, 1956)*

Pittsburgh

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 bundles	54.00 to 55.00
No. 2 bundles	46.00 to 47.00
Machine shop turn	37.00 to 38.00
Mixed bor. and ms. turn	37.00 to 38.00
Shoveling turnings	41.00 to 42.00
Cast iron borings	41.00 to 42.00
Low phos. punch'gs plate	60.00 to 61.00
Heavy turnings	48.00 to 49.00
No. 1 RR. hvy. melting	58.00 to 59.00
Scrap rails, random lgth	64.00 to 65.00
Rails 2 ft and under	69.00 to 70.00
RR. steel wheels	62.00 to 63.00
RR. spring steel	62.00 to 63.00
RR. couplers and knuckles	62.00 to 63.00
No. 1 machinery cast	55.00 to 56.00
Cupola cast	49.00 to 50.00
Heavy breakable cast	45.00 to 46.00

Chicago

No. 1 hvy. melting	$49.00 to $50.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 factory bundles	53.00 to 54.00
No. 1 dealers' bundles	50.00 to 51.00
No. 2 dealers' bundles	39.00 to 40.00
Machine shop turn	29.00 to 30.00
Mixed bor. and turn	31.00 to 32.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. forge crops	59.00 to 60.00
Low phos. punch'gs plate	56.00 to 57.00
Low phos. 3 ft and under	55.00 to 56.00
No. 1 RR. hvy. melting	53.00 to 54.00
Scrap rails, random lgth	63.00 to 64.00
Rerolling rails	72.00 to 73.00
Rails 2 ft and under	68.00 to 69.00
Locomotive tires, cut	57.00 to 58.00
Cut bolsters & side frames	58.00 to 59.00
Angles and splice bars	66.00 to 67.00
RR. steel car axles	67.00 to 68.00
RR. couplers and knuckles	58.00 to 59.00
No. 1 machinery cast	54.00 to 56.00
Cupola cast	51.00 to 52.00
Heavy breakable cast	43.00 to 44.00
Cast iron brake shoes	40.00 to 41.00
Cast iron car wheels	49.00 to 50.00
Malleable	62.00 to 63.00
Stove plate	42.00 to 43.00

Philadelphia Area

No. 1 hvy. melting	$55.00 to $56.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 bundles	55.00 to 56.00
No. 2 bundles	46.00 to 47.50
Machine shop turn	37.00 to 38.00
Mixed bor. short turn	37.00 to 38.00
Cast iron borings	37.00 to 38.00
Shoveling turnings	39.50 to 40.50
Clean cast chem. borings	44.00 to 45.00
Low phos. 5 ft and under	57.50 to 58.50
Low phos. 2 ft and under	59.00 to 60.00
Low phos. punch'gs	59.00 to 60.00
Elec. furnace bundles	56.00 to 57.00
Heavy turnings	51.00 to 52.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
Rails 18 in. and under	65.00 to 67.00
Cupola cast	52.00 to 53.00
Heavy breakable cast	53.00 to 54.00
Cast iron car wheels	58.00 to 59.00
Malleable	66.50 to 67.50
Unstripped motor blocks	39.00 to 40.00
No. 1 machinery cast	57.00 to 58.00

Cleveland

No. 1 hvy. melting	$52.50 to $53.50
No. 2 hvy. melting	42.50 to 43.50
No. 1 bundles	52.50 to 53.50
No. 2 bundles	41.00 to 43.00
No. 1 busheling	52.50 to 53.50
Machine shop turn	30.50 to 31.50
Mixed bor. and turn	34.50 to 35.50
Shoveling turnings	34.50 to 35.50
Cast iron borings	32.00 to 33.00
Cut struct'r'l & plates, 2 ft & under	61.00 to 62.00
Drop forge flashings	54.50 to 55.50
Low phos. punch'gs, plate	53.50 to 54.50
Foundry steel, 2 ft & under	55.00 to 56.00
No. 1 RR. heavy melting	55.00 to 56.00
Rails 2 ft and under	71.00 to 72.00
Rails 18 in. and under	72.00 to 73.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	34.00 to 35.00
Railroad cast	57.00 to 58.00
No. 1 machinery cast	56.00 to 57.00
Stove plate	53.00 to 54.00
Malleable	58.00 to 59.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$55.00 to $56.00
No. 2 hvy. melting	44.50 to 45.50
No. 1 bundles	55.00 to 56.00
No. 2 bundles	43.00 to 44.00
Machine shop turn	32.00 to 33.00
Shoveling turnings	36.50 to 37.50
Cast iron borings	36.50 to 37.50
Low phos. plate	56.00 to 57.00

Buffalo

No. 1 hvy. melting	$49.00 to $50.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 busheling	49.00 to 50.00
No. 1 bundles	49.00 to 50.00
No. 2 bundles	39.00 to 40.00
Machine shop turn	27.00 to 28.00
Mixed bor. and turn	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	54.00 to 55.00
Scrap rails, random lgth	51.00 to 52.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	55.00 to 56.00
RR. spring steel	55.00 to 56.00
RR. couplers and knuckles	55.00 to 56.00
No. 1 machinery cast	51.00 to 52.00
No. 1 cupola cast	47.00 to 48.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles, openhearth	47.00 to 48.00
No. 2 bundles	35.00 to 36.00
New busheling	47.00 to 48.00
Drop forge flashings	46.50 to 47.50
Machine shop turn	23.00 to 24.00
Mixed bor. and turn	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs, plate	50.00 to 51.00
No. 1 cupola cast	46.00 to 47.00
Heavy breakable cast	39.00 to 40.00
Stove plate	40.00 to 41.00
Automotive cast	50.00 to 51.00

St. Louis

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	43.00 to 44.00
No. 2 bundles	35.00 to 36.00
Machine shop turn	28.00 to 29.00
Cast iron borings	30.00 to 31.00
Shoveling turnings	30.00 to 31.00
No. 1 RR. hvy. melting	53.00 to 54.00
Rails, random lengths	59.50 to 60.50
Rails, 18 in. and under	65.00 to 66.00
Locomotive tires uncut	55.50 to 56.50
Angles and splice bars	58.00 to 59.00
Std. steel car axles	60.00 to 61.00
RR. specialties	57.00 to 58.00
Cupola cast	49.00 to 50.00
Heavy breakable cast	40.00 to 41.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	40.00 to 41.00
Cast iron car wheels	47.00 to 48.00
Rerolling rails	63.00 to 64.00
Malleable	50.00 to 51.00
Unstripped motor blocks	40.00 to 41.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	46.00 to 47.00
Elec. furnace, 3 ft & under	50.00 to 51.00
Machine shop turn	25.00 to 26.00
Mixed bor. and short turn	27.00 to 28.00
Shoveling turnings	29.50 to 30.00
Clean cast chem. borings	28.00 to 29.00
No. 1 machinery cast	48.00 to 49.00
Mixed cupola cast	42.50 to 43.50
Heavy breakable cast	42.00 to 42.50
Stove plate	38.00 to 39.00
Unstripped motor blocks	27.00 to 28.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$50.50
No. 2 hvy. melting	$46.00 to 47.00
No. 2 bundles	39.50 to 40.50
Machine shop turn	28.00 to 29.00
Mixed bor. and turn	29.00 to 30.00
Shoveling turnings	30.00 to 31.00
Clean cast chem. borings	32.00 to 33.00
No. 1 machinery cast	50.00 to 51.00
Mixed yard cast	47.00 to 48.00
Charging box cast	47.00 to 48.00
Heavy breakable cast	47.00 to 48.00
Unstripped motor blocks	32.00 to 33.00

Birmingham

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	45.00 to 46.00
Machine shop turn	29.00 to 30.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	19.00 to 20.00
Electric furnace bundles	48.00 to 49.00
Bar crops and plate	54.00 to 55.00
Structural and plate, 2 ft	54.00 to 55.00
No. 1 RR. hvy. melting	51.00 to 52.00
Scrap rails, random lgth	59.00 to 60.00
Rails, 18 in. and under	64.00 to 65.00
Angles & splice bars	61.00 to 62.00
Rerolling rails	64.00 to 65.00
No. 1 cupola cast	47.50 to 48.50
Stove plate	46.00 to 47.00
Charging box cast	32.00 to 33.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	39.00 to 40.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	47.00 to 48.00
No. 2 bundles	38.00 to 40.00
Machine shop turn	33.00 to 34.00
Mixed bor. and turn	30.00 to 31.00
Shoveling turnings	36.00 to 37.00
Cast iron borings	30.00 to 31.00
Low phos. 18 in. & under	56.00 to 57.00
Rails, random lengths	61.00 to 62.00
Rails, 18 in. and under	67.00 to 68.00
No. 1 cupola cast	46.00 to 47.00
Hvy. breakable cast	44.00 to 45.00
Drop broken cast	55.50 to 56.50

San Francisco

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 1 bundles	43.00
No. 2 bundles	38.00
No. 3 bundles	29.00
Machine stop turn	23.00
Cast iron borings	23.00
No. 1 RR. hvy. melting	44.00
No. 1 cupola cast	50.00

Los Angeles

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 1 bundles	41.00
No. 2 bundles	33.00
No. 3 bundles	29.00
Machine shop turn	20.00
Shoveling turnings	23.00
Cast iron borings	20.00
Elec. furn. 1 ft and under	42.00
No. 1 RR. hvy. melting	42.00
No. 1 cupola cast	48.00

Seattle

No. 1 hvy. melting	$48.00
No. 2 hvy. melting	44.00
No. 2 bundles	38.00
No. 3 bundles	30.00
No. 1 cupola cast	45.00
Mixed yard cast	45.00

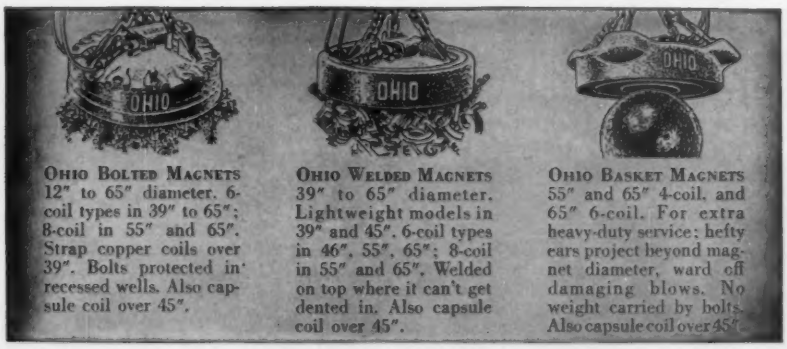
Hamilton, Ont.

No. 1 hvy. melting	$45.50
No. 2 hvy. melting	41.50
No. 1 bundles	45.50
No. 2 bundles	38.00
Mixed steel scrap	39.50
Bushelings	35.50
Bush., new fact., prep'd	43.50
Bush., new fact., unprep'd	39.50
Machine shop turn	18.00
Short steel turn	27.50
Mixed bor. and turn	$16.00 to 19.00
Rails, rerolling	53.50
Cast scrap	42.00 to 45.00

■ Size for size, Ohio Magnets lift larger loads over longer periods because they *operate cooler*. So for extra magnet lifting power, extra magnet value—always specify Ohio Magnets and Ohio Magnet Controllers. There's a type and size for every lifting job.

Send for free copy of Bulletin 112.
Consult the Yellow Pages for
Ohio offices in principal cities.

for performance . . . it's Ohio Magnets



OHIO BOLTED MAGNETS 12″ to 65″ diameter. 6-coil types in 39″ to 65″; 8-coil in 55″ and 65″. Strap copper coils over 39″. Bolts protected in recessed wells. Also capsule coil over 45″.

OHIO WELDED MAGNETS 39″ to 65″ diameter. Lightweight models in 39″ and 45″. 6-coil types in 46″, 55″, 65″; 8-coil in 55″ and 65″. Welded on top where it can't get dented in. Also capsule coil over 45″.

OHIO BASKET MAGNETS 55″ and 65″ 4-coil, and 65″ 6-coil. For extra heavy-duty service; hefty ears project beyond magnet diameter, ward off damaging blows. No weight carried by bolts. Also capsule coil over 45″.

Ohio also makes
Separation Magnets,
Heavy-Duty Electric Hoists,
Nail Making Machines,
Fractional Horsepower,
Shell and Torque Motors,
Precision Threaded Parts for
Aircraft Engine Manufacturers.

THE OHIO ELECTRIC MFG. CO.
5400 Dunham Rd., Maple Heights • Cleveland, Ohio

ohio ELECTRIC

Chester Bland
President

London Foretells Lead Drop

Drop in British Automotive demand breaks London lead market . . . Domestic price follows London . . . Down ½¢ to 15.80¢ per lb . . . Zinc quiet and firm both places.

◆ AFTER ALMOST seven days of steadily declining prices in London, the price of lead in the U. S. dropped ½¢ to 15.80¢ per lb. Zinc market in London was quiet and relatively firm; zinc price in the U. S. held unchanged.

Rarely does a situation occur when the price in London is so directly tied to that in the U. S. The price increases in lead and zinc did not, as is usually the case, reflect any shortage in this country. It was the proverbial ounce of prevention.

The price in London had been rising. Mexican producers were eyeing the more lucrative returns from continental buyers. To prevent lead and zinc which had been coming to the U. S. from finding its way to other markets, smelters and domestic producers pushed the price up in competition with London.

A cutback in the demand for lead by British automotive and machine parts industries dropped prices considerably. The lure disappeared. The counteracting price move was no longer necessary.

Things have not settled down yet. Watch the London market. Any sizable change in the price of lead or zinc will be reflected in the future price structure in the U. S. And there is no indication the London market has stabilized.

ALUMINUM . . . Kaiser Aluminum & Chemical Corp. is jumping into the lucrative aluminum foil container market with both feet. As part of the recently-announced $400 million expansion program, the company will acquire two plants to produce aluminum foil containers for the frozen food industry.

Perhaps the bigger of the two moves is the purchase of Foil Kraft, Inc., Los Angeles, one of the largest organizations in this field. Kaiser will assume the management at once, although no basic changes in operations are planned.

While the Foil Kraft plant is handling the lion's share of the new Kaiser foil containers, the company will be constructing a second plant comparable in size and capacity at Wanatah, Ind., a short distance from Kaiser's sheet and foil rolling mill at Ravenswood, W. Va. The new foil container plant goes into full operation this summer.

Extensive research is planned, aimed at the development of new and more efficient containers to help improve Kaiser's competitive position in this now highly-competitive field.

Office of Defense Mobilization is withholding its judgment on aluminum forging and sheet production expansion goals, which lapsed Dec. 31.

ODM prefers to say "lapsed" rather than "closed," holding that the door is not completely shut to applicants for fast tax write-off certificates for new facilities. The sheet producing area was oversubscribed, but not the heat treating or aluminum forging.

Commerce Dept. is reviewing with the Defense Dept. military needs for aluminum to find if further production expansion is necessary. When this review is completed, perhaps within the next two months, Defense Mobilizer Flemming will decide whether additional write-off certificates should be made available.

In the Business and Defense Services Administration, the Aluminum Div. points out that it also considers the sheet goal oversubscribed, though not closed. The division prefers that this goal remain open for replacement applications, if needed. It says the study of requirements is based on "constantly changing military demands."

EXPORT . . . Quotas for export of copper and copper scrap in the January-March quarter are set at the levels which applied during the fourth quarter 1955.

These quotas, says the U. S. Bureau of Foreign Commerce, include 600 short tons (metal weight) of copper-base alloy ingots and other crude forms; 3,000 short tons of new and old copper scrap; and 6,000 short tons (copper content) of new and old copper-base alloy scrap containing 40 pct or more copper.

Unrefined copper of domestic origin, not approved for export previously, will be licensed on an open-end basis. This basis also will apply to refined copper of foreign origin, except that produced from Canadian-origin scrap; unrefined copper of foreign origin; copperweld rods; low-grade copper scrap materials containing less than 40 pct copper and a maximum nickel content of 5 pct.

As in the fourth quarter, exports of refined domestic copper, except copperweld rods, will generally be disapproved. Meanwhile a deadline of March 16 has been fixed for filing applications with the U. S. Commerce Dept. for first-quarter licensing of some types of aluminum and copper scrap and ingots.

Cutoff date applies to exports of new and old aluminum scrap (Schedule B No. 630050) aluminum remelt ingots (B No. 630070); new and old copper scrap (B No. 641300); new and old copper-base alloy scrap containing 40 pct or more copper (B No. 644000); and copper base alloy ingots and other crude forms (B No. 644100).

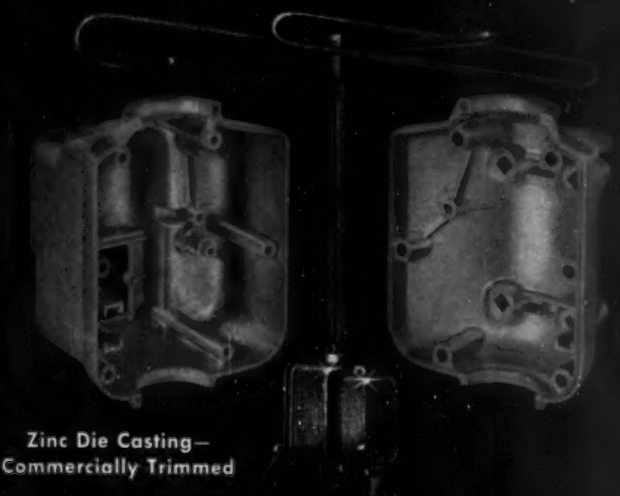
Applications for export of copper ores, concentrates, matte, and other unrefined copper (B No. 640100) will be considered for first quarter approval regardless of domestic or foreign origin.

Daily Nonferrous Metal Prices

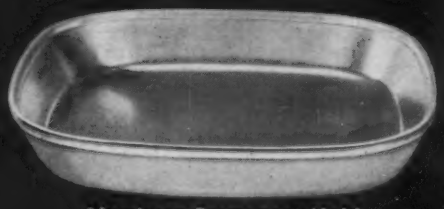
(Cents per lb except as noted)

	Jan. 11	Jan. 12	Jan. 13	Jan. 14	Jan. 16	Jan. 17
Copper, electro, Conn.	43.00	43.00	43.00	....	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	....	43.00	43.00
Tin, Straits, New York	106.25	106.00	105.75	105.50	104.625	104.50*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	16.30	16.30	15.80	15.80	15.80	15.80

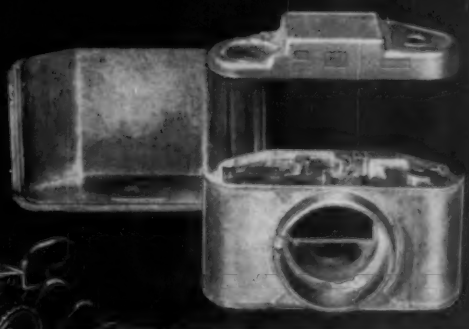
Note: Quotations are going prices. **Tentative*



Zinc Die Casting—
Commercially Trimmed



Aluminum Permanent Mold
Casting—Machined & Velvaglazed®



Aluminum Die Casting—
Commercially Trimmed

Want more casting value per dollar?

Monarch pioneers in casting progress. Our casting and finishing facilities, unique in the industry, produce unusual casting performance. The job your casting must perform is economically accomplished with jobs we perform on the casting.

Illustrated are a few major industries capitalizing on Monarch's ability to guarantee top-value castings at factual, low end-cost.

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ALUMINUM
PIONEERS IN CASTING PROGRESS

MONARCH ALUMINUM MFG. COMPANY
9205 Detroit Avenue, Cleveland 2, Ohio

Aluminum Permanent Mold
Casting—Velvaglazed®

Aluminum Die Casting—
Commercially Trimmed

Aluminum Die Casting—
Commercially Trimmed

Nonferrous Prices *(Effective Jan. 17, 1956)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1100, 3003	40.8	38.7	37.5	36.5
5052	48.3	43.4	41.7	39.9
6061–0	45.4	41.2	39.4	39.3

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6– 8	41.6–43.3	56.6–60.2
12–14	42.3–43.7	57.5–61.8
24–26	45.3–45.7	67.7–72.1
36–38	53.6–54.2	90.5–94.3

Screw Machine Stock—2011-T-3

Size"	¼	⅝–⅝	¾–1	1¼–1½
Price	54.5	53.4	52.1	50.1

Roofing Sheet, Corrugated

(Per sheet, 26" wide, base, 16,000 lb)

Length" →	72	96	120	144
.019 gage	$1.295	$1.727	$2.160	$2.590
.024 gage	1.615	2.162	2.692	3.232

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 61¢; 3/16 in., 62¢; ½ in., 61¢; 0.064 in., 78¢; 0.032 in., 99¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: FS, diam ¼ to 0.311 in., 82.5¢; ½ to ¾ in., 65¢; 1¼ to 1.749 in., 60.5¢; 2½ to 5 in., 57¢. Other alloys higher. Base up to ¾ diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: FS. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 70.7¢; 0.22 to 0.25 lb, 5.9 in., 66.9¢; 0.50 to 0.59 lb, 8.6 in., 63¢; 1.8 to 2.59 lb, 19.5 in., 60.8¢; 4 to 6 lb, 28 in., 57.7¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: FS, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.625; 5/16 to ⅝ in., $1.475; ½ to ⅝ in., $1.105; 1 to 2 in., 92.5¢; 0.165 to 0.219 in. wall: OD ⅝ to ⅞ in., 75.5¢; 1 to 2 in., 71.5¢; 3 to 4 in., 70.5¢. Other alloys higher. Base OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	62.13	....	63.48
Copper, h-r	58.76	59.11	....
Copper, drawn	....	60.36	....
Low brass	56.55	56.49	....
Yellow brass	52.27	52.21	....
Red brass	58.09	58.03	....
Naval brass	52.83	49.94	48.40
Leaded brass	....	....	48.42
Com. bronze	60.18	60.12	....
Mang. bronze	59.39	53.38	54.94
Phos. bronze	81.00	81.50	....
Muntz metal	53.74	49.55	50.80
Ni silver 10 pct	66.00	68.33	70.68

Beryllium copper Cr, 1.9% Be, Base 2000 lb, f.o.b.

Strip	$1.84
Rod, bar, wire	1.81

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	92
Angles, HR	87	74	93
Plate, HR	97	87	95
Seamless Tube	122	110	153
Shot, Blocks	...	71	...

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $13.10-$13.60; alloy $15.25-$15.75; Plate, HR, commercially pure, $10.50-$11.00; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.50-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.90-$8.15; alloy, $7.90-$8.10.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb. freight allowed	24.40
Aluminum pig	22.50
Antimony, American, Laredo, Tex.	33.50
Beryllium copper, per lb conta'd Be	$43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	43.66
Copper, Lake, delivered	43.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $120
Lead, St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	32.50
ingot	33.25
Magnesium, sticks, 100 to 500 lb	53.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$280 to $284
Nickel electro	64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$23 to $24
Platinum, dollars per troy oz.	$97 to $107
Silver, New York, cents per troy oz.	91.00
Tin, New York	104.50
Titanium sponge, grade A-1	$3.15 to $3.45
Zinc, East St. Louis	13.50
Zinc, New York	14.00
Zirconium, sponge	$10.00

* Tentative

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	42.00
No. 120	41.25
No. 123	40.50
80-10-10 ingot	
No. 305	45.75
No. 315	44.00
88-10-2 ingot	
No. 210	58.25
No. 215	54.75
No. 245	48.75
Yellow ingot	
No. 405	33.25
Manganese bronze	
No. 421	37.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	32.75-34.00
0.60 copper max.	32.50-33.75
Piston alloys (No. 122 type)	32.75-33.75
No. 12 alum. (No. 2 grade)	31.50-32.25
108 alloy	31.50-32.00
195 alloy	33.00-34.00
13 alloy (0.60 copper max.)	32.50-33.75
AXS-679	31.50-32.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	31.50-32.75
Grade 2—92-95%	30.50-31.75
Grade 3—90-92%	30.00-31.00
Grade 4—85-90%	29.25-30.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	39	38¼
Yellow brass	28⅞	26⅝
Red brass	34¼	32⅞
Comm. bronze	35⅝	35
Mang. bronze	27	25¾
Yellow brass rod ends	28⅝	....

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	43
No. 2 copper wire	41
Light copper	38½
*Refinery brass	37½—38

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	43
No. 2 copper wire	41
Light copper	38½
No. 1 composition	34½
No. 1 comp. turnings	34
Hvy. yellow brass solids	24½
Brass pipe	28
Radiators	26
Aluminum	
Mixed old cast	21½—22½
Mixed new clips	22 —23½
Mixed turnings, dry	21½—22½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	39½—40
No. 2 heavy copper and wire	37 —37½
Light copper	35 —35½
New type shell cuttings	34 —34½
Auto radiators (unsweated)	23 —23½
No. 1 composition	30½—31
No. 1 composition turnings	28½—29
Unlined red car boxes	24½—25
Cocks and faucets	24 —24½
Clean heavy yellow brass	19½—20
Brass pipe	24½—25
New soft brass clippings	25 —25½
No. 1 brass rod turnings	23 —23½

Aluminum

Alum. pistons and struts	18 —18½
Aluminum crankcases	16¾—17¼
1100 (2S) aluminum clippings	20½
Old sheet and utensils	16¾—17¼
Borings and turnings	11½—12
Industrial castings	16¾—17¼
2024 (24s) clippings	18½—19

Zinc

New zinc clippings	8½— 9
Old zinc	6 — 6½
Zinc routings	4¼
Old die cast scrap	5½

Nickel and Monel

Pure nickel clippings	$1.50
Clean nickel turnings	$1.25
Nickel anodes	$1.50
Nickel rod ends	$1.50
New Monel clippings	60
Clean Monel turnings	50
Old sheet Monel	55
Nickel silver clippings, mixed	25
Nickel silver turnings, mixed	21

Lead

Soft scrap lead	12½—13
Battery plates (dry)	6¾— 7
Batteries, acid free	4½

Magnesium

Segregated solids	18½—19
Castings	17½—18

Miscellaneous

Block tin	81 —82
No. 1 pewter	64 —65
Auto babbitt	43½—44½
Mixed common babbitt	15½
Solder joints	20¾—21¼
Siphon tops	50
Small foundry type	16¼—16½
Monotype	14¾—15¼
Lino. and stereotype	14 —14½
Electrotype	12¼—12¾
Hand picked type shells	10½—11
Lino. and stereo. dross	5¾— 6
Electro. dross	4¾— 5

STEEL PRICES

(Effective Jan. 17, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.80 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.80 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.425 *B3*	9.10 *B3*		
	Claymont, Del.													
	Harrison, N. J.													13.45 *C11*
	Conshohocken, Pa.								4.375 *A2*	6.30 *A2*	6.425 *A2*			
	New Bedford, Mass.									6.70 *R6*				
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.80 *B1*							
	Boston, Mass.									6.85 *T8*				13.80 *T8*
	New Haven, Conn.									6.70 *D1 A5*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.10 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.80 *N7 A5*				*A5* 13.80 *N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*										13.45 *G4*
	Chicago, Ill.	$68.50 *U1*	$84.50 *R3, U1,W8*	$96.00 *R3, U1,W8*	5.45 *U1*	4.60 *U1, W8*	6.75 *U1, Y1*	4.60 *U1*	4.55 *A1* 4.325 *N4,W8*	6.35 *A1,T8*			7.20 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D1,D2, G3,M2,P11*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *U1*	$84.50 *U1*	$96.00 *U1, Y1*	5.45 *I3*	4.60 *U1, I3*	6.75 *U1, I3*		4.325 *I3, U1,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, U1,Y1*	9.30 *Y1*	7.20 *Y1, U1*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.	$68.50 *C10*	$84.50 *C10*	$96.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *U1, J3*	$84.50 *J3, U1,C11*	$96.00 *U1, C11*	5.45 *U1*	4.60 *U1, J3*	6.75 *U1, J3*	4.60 *U1*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio								4.325 *P7*					
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio		$84.50 *C10*	$96.00 *Y1, C10*		4.60 *Y1*	6.75 *Y1*		4.325 *U1, Y1*	6.25 *Y1,C5*	6.425 *U1, Y1*	9.30 *Y1*	7.20 *U1, Y1*	13.45 *C5*
WEST	Fontana, Cal.	$76.00 *K1*	$92.00 *K1*	$115.00 *K1*		5.25 *K1*	7.40 *K1*	5.40 *K1*	5.075 *K1*	8.00 *K1*	7.525 *K1*		8.85 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.30 *C7, H2*	7.45 *B2*		5.075 *C7, B2*	8.30 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.075 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			5.10 *C16* 4.80 *R3,T2*	6.75 *T2*		4.325 *R3,T2* 4.825 *C16*		6.425 *T2*			
	Houston, Lone Star, Tex.	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	

STEEL PRICES

(Effective Jan. 17, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			5.375 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.375 *A2*	5.375 *A2*				6.425 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.025 *B3*			
	Fairless, Pa.	4.375 *U1*	5.375 *U1*				6.425 *U1*	7.925 *U1*				$9.30 *U1*	$8.00 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.125 *B3*	$9.30 *B3*	$8.00 *B3*	
	Worcester, Mass.										5.325 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.20 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.55 *A1* 4.325 *W8*					6.375 *U1*				5.025 *A5, N4,R3*			
	Sterling, Ill.										5.125 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.025 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.325 *N5*	5.325 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *I3, U1,Y1*	5.325 *I3, U1,Y1*	5.85 *U1, I3*	5.90 *U1, I3*	6.25 *U1*	6.375 *Y1, U1,I3*	7.875 *U1, Y1*			5.025 *Y1*	$9.20 *I3, U1,Y1*	$7.90 *I3, U1,Y1*	6.65 *U1, Y1*
	Granite City, Ill.	4.525 *G2*	5.525 *G2*	6.05 *G2*	6.10 *G2*								$8.00 *G2*	6.75 *G2*
	Kokomo, Ind.			5.95 *C9*							5.475 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*				*E2*				
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3,N3*	5.325 *R3, N3*	5.85 *R3* 6.85 *N3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*				$9.20 *R3*	$7.90 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, U1,P6*	5.325 *J3, U1,P6*	5.85 *U1*	5.90 *U1, A7*		6.375 *J3, U1*	7.875 *U1*	8.60 *U1*		5.025 *A5 P6*	$9.20 *J3, U1*	$7.90 *J3, U1*	6.65 *U1*
	Portsmouth, Ohio	4.325 *P7*	5.325 *P7*								5.375 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5,F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$9.20 *W3, W5*	$7.90 *W3, W5*	6.65 *F3, W5*
	Youngstown, Ohio	4.325 *U1, Y1*	5.325 *Y1*		5.90 *Y1*		6.375 *U1, Y1*	7.875 *Y1*			5.025 *Y1*			
WEST	Fontana, Cal.	5.075 *K1*	6.425 *K1*				7.125 *K1*	8.975 *K1*						
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.275 *S2*			
	Los Angeles, Torrance, Cal.										5.825 *B2*			
	Minnequa, Colo.										5.275 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.60 *C7*							5.675 *C7*	$9.95 *C7*	$8.65 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.025 *R3, T2*	$9.30 *T2*	$8.00 *T2*	
	Houston, Tex.										5.275 *S2*			

STEEL PRICES

(Effective Jan. 17, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.575 *B3*	7.425 *B3*	6.80 *B3*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	6.30 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.60 *W6*
	Claymont, Del.							4.80 *C4*		6.30 *C4*	6.725 *C4*	
	Coatesville, Pa.							4.80 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.50 *A2*	5.575 *A2*		6.725 *A2*	
	Harrisburg, Pa.							5.10 *P2*	5.575 *C3*			
	Hartford, Conn.			6.40 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.25 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.70 *W10*		7.60 *W10*						
	Camden, N. J.			6.35 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.80 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.35 *B3*
	Palmer, Worcester, Readville, Mass.			6.35 *W11* 6.45 *C14* 6.80 *B5*		7.725 *A5,B5*		4.50 *R3*				6.55 *A5* 6.90 *W6*
	Spring City, Pa.			6.35 *K4*		7.60 *K4*						
MIDDLE WEST	Alton, Ill.	4.85 *L1*										6.425 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N5*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		5.90 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E2*				
	Chicago, Joliet, Ill.	4.65 *U1, N4,W8,R3, P13*	4.65 *N4,R3, P13*	5.90 *A5,L2* 6.25 *B5, W8, W10*	5.575 *U1,R3, W8*	7.425 *A5,W8, W10,L2,B5*		4.50 *U1,W8, I3,A1,R3*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.25 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	5.90 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.60 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.25 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.45 *B5* 6.15 *P3* 6.10 *P8*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3* *P8*	6.90 *G3*	4.60 *G3*			6.825 *G3*	
	Duluth, Minn.											6.25 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	5.90 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1, I3, Y1*	4.50 *I3, U1, Y1*	5.575 *I3*	6.30 *U1, Y1*	6.725 *U1, I3, Y1*	6.35 *M4*
	Granite City, Ill.							4.70 *G2*				
	Kokomo, Ind.											6.70 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.35 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		5.90 *C10*	5.575 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	5.90 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.25 *A5, J3, P6*
	Portsmouth, Ohio											6.60 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1, Y1, C10,R3*	4.65 *U1, Y1, R3*	5.90 *Y1, U1*	5.575 *U1, Y1, C10*	7.425 *Y1,C10 F2*	6.80 *U1, Y1*	4.50 *U1, Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.25 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.35 *K1*	5.35 *K1*		6.625 *K1*		7.50 *K1*	5.15 *K1*		6.95 *K1*	7.375 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.50 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.35 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.20 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.50 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.20 *C7*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	4.85 *A8*	4.85 *A8*									6.45 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,R3* 5.15 *C16*	4.65 *T2,R3* 5.15 *C16*				6.80 *T2*	4.50 *T2,R3*			6.725 *T2*	6.25 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.60 *S2*		6.40 *S2*	6.825 *S2*	6.50 *S2*

Steel Prices *(Effective Jan. 17, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per ne' ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Youngstown *R3*	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75								
Fontana *K1*	7.00	+2.25	10.00	+5.25	12.50	+4.75	15.00	+3.00	15.50	+2.00	16.00	+1.50	17.50	+0.75								
Pittsburgh *J3*	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Sharon *M3*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Fairless *N2*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Pittsburgh *N1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Wheatland *W4*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Youngstown *Y1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Indiana Harbor *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75								
Lorain *N2*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Youngstown *R3*	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75								
Fairless *N2*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Fontana *K1*	11.50		15.50		17.50		18.00		18.50		19.00		19.50									
Pittsburgh *J3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Alton, Ill. *L1*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Sharon *M3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Pittsburgh *N1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Wheeling *W5*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Wheatland *W4*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Youngstown *Y1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Indiana Harbor *Y1*	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Lorain *N2*	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75

Threads only, buttweld and seamless 2¼ pt higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2 in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.60
18	4	1	—	5	2.305
18	4	2	—	—	1.765
1.5	4	1.5	8	—	.96
6	4	3	6	—	1.35
6	4	2	5	—	1.105

High-carbon chromium ..... .77
Oil hardened manganese ..... .43
Special carbon ..... .39
Extra carbon ..... .33
Regular carbon ..... .275

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	Plate (*A3, J2, L4*) 15 pct	Plate (*A3, J2, L4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	30.30	33.15	36.05	32.50
	316	35.50	38.45	41.40	47.00
	321	32.00	34.85	37.75	37.25
	347	34.40	37.90	41.40	48.25
	405	25.80	29.60	33.35	.....
	410, 430	25.30	29.10	32.85	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 38.00; 1 side, 30.00.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	8.40	8.60	.....
Armature	9.35	9.60	10.10
Elect.	9.95	10.20	10.70
Motor	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
		Grain Oriented	
Trans. 65	13.35	Trans. 80	17.45
Trans. 58	13.85	Trans. 73	17.95
Trans. 52	14.85		

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I5*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

LAKE SUPERIOR ORES

51.50% *Fe; natural content, delivered lower Lake ports. Prices effective for 1956 season. Freight for buyer's account.*

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.25
Old range, nonbessemer	11.10
Mesabi, bessemer	11.10
Mesabi, nonbessemer	10.95
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9-15½ ga. Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	152	162	...	173	175	7.40	7.80
Aliquippa, Pa. *J3*	152	162	...	...	...	7.40	7.80
Atlanta *A8*	154	167	...	175	180	7.50	8.025
Bartonville *K2**	154	166	...	175	181	7.50	8.075
Buffalo *W6*	...	...	...	...	...	7.40	7.80
Chicago, Ill. *N4***	152	166	...	173	179	7.40	8.00
Cleveland *A6*	157	...	...	...	...	7.40	.....
Cleveland *A5*	...	...	...	...	...	7.40	.....
Crawfordsville *M4**	154	167	...	175	175	7.50	8.05
Donora, Pa. *A5*	152	162	...	173	175	7.40	7.80
Duluth *A5*	152	162	...	173	175	7.40	7.80
Fairfield, Ala. *T2*	152	162	...	173	175	7.40	7.80
Galveston *D4*	157	...	...	...	...	...	.....
Houston *S2*	167	170	...	...	180	7.65	8.05
Johnstown, Pa. *B3**	152	166	...	...	175	7.40	7.80
Joliet, Ill. *A5*	152	162	...	173	175	7.40	7.80
Kokomo, Ind. *C9*	154	154	...	175	177	7.50	7.90
Los Angeles *B2**	...	...	...	...	...	8.35	8.925
Kansas City *S2*	167	174	...	178	180	7.65	8.05
Minnequa *C6*	157	167	162	178	180	7.65	8.05
Monessen *P6*	152	162	...	...	...	7.40	7.80
Moline, Ill. *R3*	...	162	162	...	...	...	.....
Pittsburg, Cal. *C7*	171	185	...	...	195	8.35	8.75
Portsmouth *P7*	...	...	...	...	...	7.40	.....
Rankin, Pa. *A5*	152	162	...	...	175	7.40	7.80
So. Chicago *R3*	152	162	157	173	175	7.40	7.80
S. San Francisco *C6*	...	...	...	197	195	8.35	8.75
Sparrows Pt. *B3**	154	...	...	175	181	7.50	8.075
Struthers, O. *Y1*	...	...	...	...	...	7.40	7.90
Worcester *A5*	158	...	...	...	...	7.70	.....
Williamsport, Pa. *S5*	...	...	160	...	...	.....	.....

Galvanized products computed with zinc at 5¢ per lb. Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (10 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Baltimore	$.10	7.03	8.32	8.37	7.65	.....	7.21	7.93	7.61	8.62	14.38	13.44–13.96	16.36	16.23–16.49
Birmingham	.15	6.80	7.93	8.85	7.06	.....	6.99	7.28	7.08	9.35	.....	.....	.....	.....
Boston	.10	7.70	8.81–9.36	10.27	7.94–7.96	10.30	7.89	8.13	7.83	9.53	12.15–13.80	13.40–13.45	16.65	16.50
Buffalo	.30	7.15	7.90	9.70	7.45	.....	7.45	7.70	7.45	7.90	.....	13.10	.....	16.15
Chicago	.25	7.15	8.39	8.80	7.36	.....	7.29	7.58	7.42	7.75	13.20	12.85	16.05	15.90
Cincinnati	.25	7.27	8.38	9.20	7.60	.....	7.58	8.05	7.66	8.05	13.44	13.09	16.29	16.14
Cleveland	.30	7.15	8.39	9.10	7.46	.....	7.46	7.91	7.48	7.85	.....	12.91	.....	15.96
Denver	.....	8.60	10.76	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.25	6.99	8.28	8.78	7.34	8.15	7.27	7.75	7.36	8.04	13.40	13.05	16.25	16.10
Houston	.....	7.85	8.75	10.49	8.15	.....	7.80	8.20	8.25	9.85–9.95	14.35	14.00	17.15	17.05
Kansas City	.20	7.47	8.76	9.17	7.73	.....	7.66	7.95	7.75	8.32	13.87	13.52	16.72	16.57
Los Angeles	.10	8.05	10.00	11.00	8.35	.....	8.05	8.30	8.05	10.70	.....	14.25	.....	17.85
Memphis	.10	7.12	8.25	.....	7.38	.....	7.31	7.60	7.40	9.15	.....	.....	.....	.....
Milwaukee	.25	7.24	8.48	8.89	7.45	.....	7.38	7.75	7.51	7.94	.....	12.94	.....	15.99
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.55	.....	.....	.....	.....
New York	.10	7.46	8.68	9.44	8.07	11.10	7.76	7.99	7.98	9.48	13.63	13.28	16.48	16.33
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.14	8.42	9.35	7.67	.....	7.37	7.74	7.64	8.46	13.36–13.51	13.16	16.36	16.21
Pittsburgh	.25	6.80	8.09	9.20	7.16	9.00	6.99	7.28	7.08	7.85	13.20	12.85	16.05	15.90
Portland	.....	7.80–8.60	8.80–10.15	10.65	8.00	7.95	7.75	7.85–8.15	7.95	12.20	.....	15.00	.....	17.50
Salt Lake City	.20	.....	10.60	.....	9.35	.....	.....	9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.10	9.65	10.15	8.35	.....	8.05	8.25	8.05	11.20*	.....	14.25	.....	17.85
Seattle	.00	8.55	10.40	10.80	8.65	.....	8.20	8.30	8.35	11.70	.....	14.60	.....	17.65
St. Louis	.25	7.44	8.68	9.49	7.65	.....	7.58	7.98	7.71	8.14	13.69	13.14	16.35	16.19
St. Paul	.25	7.46	8.59–9.14	9.16	7.72	.....	7.65	7.94	7.74	8.51	.....	13.51	.....	16.31

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

* Plus analysis charge.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bristol, Conn. *W12*	.....	.....	10.80	12.95	15.65
Buffalo, N. Y. *R7*	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. *S9*	.....	9.05	10.60	12.75	15.35
Cleveland *A5*	7.10	9.05	10.60	12.75	15.45
Detroit *D1*	7.20	9.15	10.70	12.85	.....
Detroit *D2*	7.20	9.15	10.70	.....	.....
Harrison, N. J. *C11*	.....	.....	10.80	12.95	15.65
Indianapolis *C5*	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. *B4*	7.00	8.95	10.50	12.65	.....
New Haven, Conn. *D1*	7.55	9.35	10.90	13.05	.....
Pawtucket, R. I. *N7*	7.55	9.25	10.80	12.95	15.65
Pittsburgh *S7*	7.10	9.05	10.60	12.75	15.45
Riverdale, Ill. *A1*	7.20	9.05	10.60	12.75	15.45
Sharon, Pa. *S1*	7.10	9.05	10.60	12.75	15.45
Trenton *R4*	.....	.....	.....	.....	.....
Wallingford *W1*	7.45	9.25	10.80	12.95	15.65
Warren, Ohio *T4*	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. *W3*	7.10	8.95	10.50	.....	.....
Worcester, Mass. *A5*	7.65	9.35	10.90	13.05	15.75
Youngstown *C5*	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.93	.....
	2½	12	41.57	49.16	40.31	.....
	3	12	47.99	56.76	46.55	.....
	3½	11	56.03	66.27	54.34	.....
	4	10	74.41	88.00	72.17	.....
National Tube	2	13	30.87	36.51	29.93	.....
	2½	12	42.57	49.16	40.31	.....
	3	12	47.99	56.76	46.55	.....
	3½	11	56.03	66.27	54.34	.....
	4	10	74.41	88.00	72.17	.....
Pittsburgh Steel	2	13	30.87	36.51	.....	.....
	2½	12	41.57	49.16	.....	.....
	3	12	47.99	56.76	.....	.....
	3½	11	56.03	66.27	.....	.....
	4	10	74.41	88.00	.....	.....

(Effective Jan. 17, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.725	5.65	5.825				
So. Chicago *R3*				7.90			
Ensley *T2*	4.725	5.65					
Fairfield *T2*		5.65		7.90		5.625	
Gary *U1*	4.725	5.65				5.625	
Ind. Harbor *I3*	4.725		5.825	7.90		5.525	
Ind. Harbor *Y1*				7.90			
Johnstown *B3*		5.65					
Joliet *U1*		5.65	5.825				
Kansas City *S2*				7.90			
Lackawanna *B3*	4.725	5.65	5.825			5.625	
Minnequa *C6*	4.725	6.15	5.825	7.90		5.625	12.40
Pittsburgh *O1*					11.90		12.40
Pittsburgh *P5*							12.40
Pittsburgh *J3*				7.90			
Seattle *B2*				8.40		5.775	12.90
Steelton *B3*	4.725		5.825			5.625	
Struthers *Y1*				7.90			
Torrance *C7*						5.775	
Williamsport *S5*		5.65					
Youngstown *R3*				7.90			

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	25.75
Detroit, f.o.b.	26.25
New England, del'd	28.55
Seaboard, N. J., f.o.b.	25.50
Philadelphia, f.o.b.	25.00
Swedeland, Pa., f.o.b.	25.00
Plainesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	24.40
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100,110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
6	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	58.92
Electrodeposited	55.25
Brass, 80-20, ball anodes, 2000 lb or more	58.00
Zinc, ball anodes, 2000 lb lots	20.75
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon	90.50
(rolled depolarized add 3¢ per lb)	
Cadmium	$1.70
Tin, ball anodes and elliptical	$1.06 to $1.10

Chemicals

(Cents per lb, fob shipping point)

Copper cyanide, 100 lb drum	83.50
Copper sulphate, 5 or more 100 lb bags, per cwt	18.15
Nickel salts, single, 4-100 lb bags	33.25
Nickel chloride, freight allowed, 300 lbs	43.50
Sodium cyanide, domestic, fob N. Y. 1 to 4 200 lb drums	21.55
(Philadelphia add .50 per lb)	
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 1 to 20 100 lb drums	31.20

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts Full case Quantity	Full case 20,000 lb. or more
½ in. & smaller x 6 in. & shorter	61	63
Larger than ½ in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex., H.P., reg. & hvy.

⅜" or smaller	64	66
⅞" to 1⅛" inclusive	63	65
1¼" to 1½" inclusive	65	67
1⅝" and larger	61	63

C.P Hex regular & hvy

⅜" or smaller	64	66
⅞" and larger	61	63

Hot Galv. Nuts (all types)

1½" or smaller	44	47

Finished, Semi-finished, Hex. Nuts

¾" and smaller	66	66
⅞" and larger	63	63

Add 25% for less than case or keg quantity.

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount H.C. Heat
Bright Treated	
New std. hex head, packaged ¼" thru ½" diam. x 6" and shorter	34
9/16 and ⅝" x 6" and smaller and shorter	31
¾", ⅞", 1" x 6" and shorter	9 +11
New std. hex head, bulk* ¼" thru ½" diam. x 6" and shorter	49 41
9/16" and ⅝" diam. x 6" and shorter	43 39
¾", ⅞", 1" x 6" and shorter	31 20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
Quantity		
¼-in. diam. & under: 25,000-200,000	20	61
5/16-in. diam. & larger: 15,000-100,000	20	61
All diam. over 3 in. long: 5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

	Discount Hex	Square
Packaged, package list	24	27
Bulk, bulk list		
Quantity		
⅜-in. diam. & smaller: 25,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.5
Chicago	122.9
San Francisco-L. A.	131.1

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa., (except Salina, Pa., add $5.00)	$122.00
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$128.00
Childs, Hays, Pa.	138.00
Chicago District	138.00
Western Utah	144.00
California	151.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O.	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	32.00

Chrome Brick

Per net ton

Standard chemically bonded, balt.	$91.00
Standards chemically bonded, Curtner, Calif.	101.25
Burned, Balt.	85.00

Magnesite Brick

Standard Baltimore	$114.00
Chemically bonded, Baltimore	102.00

Grain Magnesite

St. ¾-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed	$64.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	40.00
in sacks	46.00

Dead Burned Dolomite

Per net ton

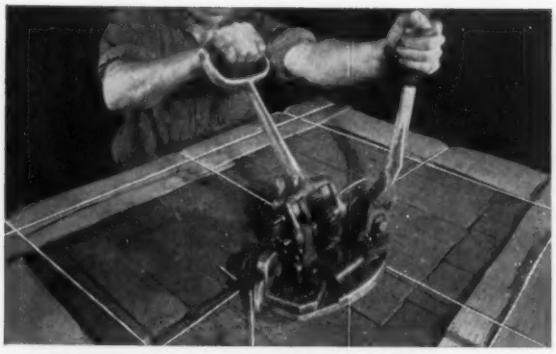
F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$15.00
Midwest	15.60
Missouri Valley	14.00

METAL POWDERS

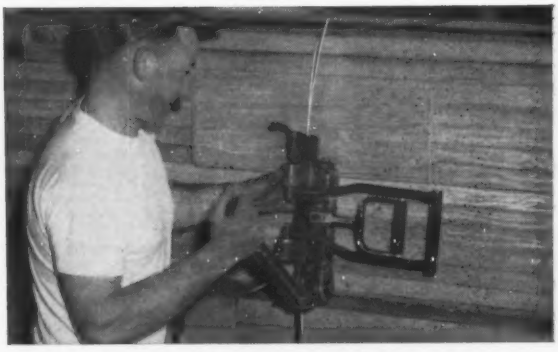
Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	9.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge, iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe	86.0¢ to $1.55
Aluminum freight allowed	34.50¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	61.50¢
Copper, reduced	61.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	7.50¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.00 to $3.25
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed, #80	$1.18
Silicon	43.50¢
Solder powder 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.30
Zinc, 10 ton lots	18.75¢ to 32.50¢

How USS GERRARD speeds handling—cuts costs

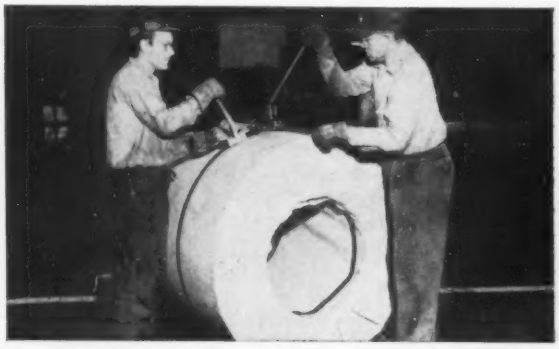


"We have been able to cut handling time, give our customers better service, balance our work load, save storage space, and reduce brick breakage through the use of USS GERRARD Round Steel Strapping," says Glen-Gery Shale Brick Corporation of Reading, Pa., largest building brick manufacturer in the East. Glen-Gery uses 12-gauge USS GERRARD Round Strapping to package bricks in easy-to-handle units of 500.



"We rely on USS GERRARD Strapping to get our houses to the building sites in perfect condition," says West Coast Mills, Chehalis, Washington, manufacturers of prefabricated Far West Homes. These attractive prefabs are shipped all over the United States by rail and truck, bundled securely with USS GERRARD Round Steel Strapping. They arrive consistently at the building sites with every piece intact.

"We reduced handling time by 75%, increased storage space by 33%, and cut shipping damage to less than 1%, by palletizing our tuyeres with USS GERRARD Flat Steel Strapping," says Climax Fire Brick Company of Climax, Pa., producer of 60% of the nation's requirements for these odd-size Bessemer Furnace fire bricks.



Waterproof-wrapped for shipment, this coil of sheet steel is being reinforced with USS GERRARD Flat Steel Strapping. Notice how strip of strapping inside coil exerts outward tension, keeping protective paper in place.

Bring your packaging-tying problems to USS GERRARD. Regardless of what they are, our engineers will help you find the safest, surest, most economical solution to them.

NEW CATALOG—HOT OFF THE PRESS! 36 pages of photographs, descriptions, facts and figures on all USS GERRARD Steel Strapping and associated equipment.

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GENERAL OFFICES: CHICAGO, ILLINOIS

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UNITED STATES STEEL

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4711 South Richmond St., Chicago 32, Ill.

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Company .....
Address .....
City ..... State.....

Ferroalloy Prices

(Effective Jan. 17, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	38.50	0.20% C	35.50
0.06% C	36.50	0.50% C	35.25
0.10% C	36.00	1.00% C	34.00
0.15% C	35.75	2.00% C	33.75

4.00-4.50 C, 67.70% Cr, 1-2% Si ... 26.25
3.50-5.00% C, 57-64% Cr, 2.00-4.00% Si ... 25.00

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	28.65
Ton lots	30.55
Less ton lots	32.05

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 3¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.27
0.50% max. C	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe..	1.36

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	41.85
Ton lots	46.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	22.95
Ton lots	25.25
Less ton lots	26.75

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.25
Johnstown, Pa.	10.25
Sheridan, Pa.	10.25
Philo, Ohio	10.25
S. Duquesne	10.25

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	12.50
Ton lots packed	14.70

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$89.50
19 to 21%	3% max.	91.50
21 to 23%	3% max.	94.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, Packed	45.75
Ton lots	44.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 22.35

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	35.55	36.75
0.07% max. C	30.95	33.50	34.70
0.15% max. C	29.45	32.00	33.20
0.30% max. C	27.95	30.50	31.70
0.50% max. C	27.45	30.00	31.20
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	24.45	27.00	28.20

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carload bulk	11.20
Ton lots	12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet	12.70
Ton lots, packed	14.90

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $98.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	22.75	21.45
98% Si, 1% Fe	23.25	21.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	7.15
Ton lots, packed	9.75

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

50% Si	12.75	75% Si	15.40
65% Si	14.50	85% Si	17.10
	90% Si	18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ... $1.34

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta ... $4.65

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo .. $1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton ... $90.00
10 tons to less carload ... $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.50
Less ton lots ... $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. ... $3.30

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. ... $1.33
bags, f.o.b. Washington, Pa., Langeloth, Pa. ... $1.30

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	17.50¢
Ton lots, packed lump	19.50¢
Less ton lots	20.00¢

Vanadium oxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ... $1.33

Zirconium contract basis, per lb of alloy

35-40%, f.o.b. freight allowed, carloads, packed	26.25¢
12-15%, del'd, lump, bulk-carloads	8.50¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si 40-45%, per lb contained 2 ... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2% Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound ... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50%, max. Al, 0.50% max. C, 1 in. x D, ton lots ... 1.20
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over

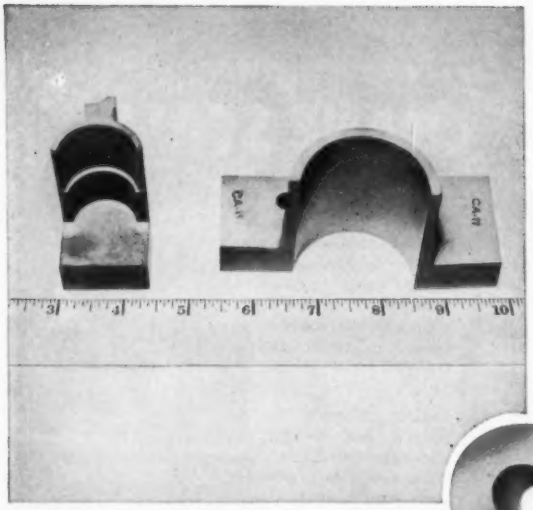
No. 1	$1.05
No. 79	50¢

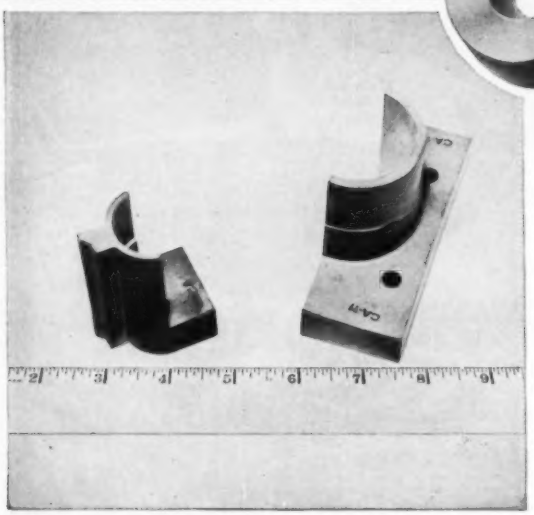
Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.40
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... $2.05

Silcaz, contract basis, delivered.
Ton lots ... 45.00¢





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"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Print Own Paper . . . Born of the Detroit newspaper strike, "The Detroit Machinery News" was published for the duration of the strike under the sponsorship of the Detroit Chapter of the Machinery Dealers National Association.

The publication was being sent free as a service to machinery buyers throughout Michigan, Ohio, Indiana, Illinois, and Ontario.

Along with news items of interest to the trade, it contained advertising similar to that normally found in the classified "Machinery & Supplies" columns of the Detroit newspapers.

Max Wender, Chairman of the Detroit Chapter of the Machinery Dealers National Association, points out, "the classified section of the Detroit Sunday papers is the accepted market place for machinery dealers and buyers in the Detroit area. As these papers have been on strike since December 1, 'The Detroit Machinery News' is fulfilling an urgent need. It will therefore continue to be published for the duration of the strike."

Copies of the paper will be sent on request to "The Detroit Machinery News," 8500 Twelfth St., Detroit 6, Mich.

Sales Peaks Cheer Chicago . . . The customers who usually go home for Christmas stayed on the job this year. Result is that used machine tools will hit an unseasonably high December total in the mid-west this year. And sales, on a volume basis, are beginning to resemble the good old days of 1951.

When the year-end statements are out, however, it's figured that profits will be substantially less than past periods of equal or higher volume selling. Though prices began to readjust upward in late third and fourth quarter '55, many used tool dealers are reporting that the upswing was too late to correct the low profit selling of the first and second halves.

The DETROIT MDNA MACHINERY NEWS

VOLUME 1 NO. 3 DETROIT, MICH. MONDAY JAN. 2, 1956

Cut Yourself In For A Slice Of Profit!

A $300,000,000 BUSINESS

Editorial

THE DETROIT MACHINERY NEWS
Published weekly for the duration of the Detroit News strike by:
THE DETROIT MACHINERY NEWS
8500 Twelfth St. Detroit 6, Mich.
TR 4-0929
In behalf of
DETROIT CHAPTER
MACHINERY DEALERS
NATIONAL ASSOCIATION
All profits go to Detroit Chapter MDNA.

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Machinery Sales
William Terry, Secretary
Newman Equipment Co. Inc.

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12' x ½" Dreis & Krump, Motor Driven
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10 ton P&H	58' Span 230 Volt D.C.
10 ton Milwaukee	80' Span 230 Volt D.C.
With 5 ton Auxiliary	
10 ton P&H	96' Span 220 Volt D.C.
15 ton P&H	56' Span 230 Volt D.C.
20 ton P&H	60' Span 230 Volt D.C.
20 ton Toledo	75' Span 550/3/60 A.C.
30 ton Alliance	50' Span 230 Volt D.C.
With 10 ton Auxiliary	
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With 10 ton Auxiliary	

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300 ton United Steam Hydr. Forging Press
530 ton Baldwin Southwark 12" Stroke 48" x 25" Between Columns
800 ton Clearing 48" Stroke, Bed Area 48" x 48"
1000 ton Lake Erie Double Acting 46" Stroke, Bed Area 72" x 146"
1257 ton Baldwin Southwark Forging Press, 30" Stroke Main Ram, 54" x 41" Bet. Columns
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4500 ton B-L-H Hydr. Forging Press
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Clearing Model TF41500-200 Triple Acting, Strokes 40, 32, 14", Bed Area 100" x 200"
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ROLLS—FORMING
8 Stand Rafter Tube Forming Machine, Spindle 1⅞"
5 Stand Bliss Roll Forming Machine, Shaft 2⅞"
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Qu.	H.P.	Make	Type	Volts	R.P.M.
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6	1500	Whse.	Mill	525	600
1	1250	G.E.	MCF	600	350/790
4	800	Whse.	Encl.	525	600
4	700	Whse.	Mill	250	300/700
2	600	Al. Ch.	Mill	600	300/600
2	500	Whse.	Mill	250	285/710
1	450/250	Al. Ch.	Mill	375/250	250/1000
1	450	Whse.	SK	230	450/600
1	350	G.E.	CD-169	230	1150
1	200/250	El. Dy.	Fed. Brg.	230	400/1200
1	200	Whse.	SK-210	230	400/800
1	180	G.E.	MPC	230	800
1	150	Whse.	SK-201	230	300/900
2	125	Whse.	SK-184	230	575/850
1	125	G.E.	MPC	230	400/600
1	100	El. Dy.	30-S	230	450/1350
2	100	El. Dy.	30-S	230	475/950
1	80	Reliance	651-T	230	575/1150
3	50	Whse.	SK-131.5	230	600/2200
1	40	G.E.	CD-123	230	500/1000
1	40	Whse.	SK-140	230	500/1700
1	32½	Whse.	SK-150	230	400/1200
2	25	Whse.	SK-93	230	1800
1	20	Cr. Wh.	D.P.B.B.	230	1150/2400
1	20	Whse.	SK-123	230	400/1200
1	15	G.E.	CD-85	230	575/2300
3	15	Whse.	SK-100L	230	500/1500
1	15	Reliance	155-T	230	400/1600
1	10	Whse.	SK-103	230	400/1600
1	10	Al. Ch.	E-123	230	300/1200
4	10	Whse.	SK-91	230	250/1000
1	7½	G.E.	CD-75	230	600/2070
1	7½	G.E.	CD-85	230	450/1350
4	5/7½	Reliance	T.E.F.C.	230	337/1350

MOTOR GENERATOR SETS

Qu.	KW	Make	R.P.M.	D.C. Volts	A.C. Volts
1	2500	Whse.	720	600	4160/2300
2	1250	Whse.	720	600	2300
1	500	Cr. Wh.	720	600	2300/440
2	500	Whse.	1200	125/250	2300/440
1	400	Cr. Wh.	1200	125/250	2300/440
1	300	G.E.	1200	250	2300
3	200	G.E.	900	125/250	2300
1	150	G.E.	1200	250	2300
1	100	Whse.	900	250	2300
1	100	Cr. Wh.	1200	125	440/220
1	75	G.E.	1200	250	440/220
3	50	G.E.	1200	250	440/220

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1	1000	A.C.	Mill	2300	240
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	G.E.	MT-412	2200	580
1	500	Whse.	CW	550	350
1	500	G.E.	M-569Z	2200	1180
1	400	Whse.	CW-960A	440	1170
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1213	2200	435
1	350	G.E.	MT-442Y	2200/4000	253
1	350	G.E.	TM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-559S	2200	1800
1	250	Al. Ch.		550	690
1	200	Cr. Wh.	26QB	440	505
1	200	G.E.	IM	440	435
1	200	G.E.	IM	2200	580
1	150	(unused) Whse.	CW	2300	435
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-16	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
2	650	G.E.	FT-559BY	440	3570
1	500	G.E.	K-6345-8	2300	1185
2	450	Whse.	CS-1429	2300/4150	354
1	400	G.E.	IB-15B	2200	1165
1	400	G.E.	IK	2200	500
1	200	G.E.	IK-17	440	580
3	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS-856S	440	880
1	150	Whse.	CS	440	580
2	125	Al. Ch.	ARW	2200	1750
1	100	Whse.	CS-876C-TEFC	440	710

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2	2000	Whse.		2300	120
2	1750	G.E.	ATI	2300	3600
2	735	G.E.	ATI	2300/12000	600
1	500	Ideal	SM	2300/4160	1800
2	500	G.E.	TS-7567	2300	1200
1	450	Whse.		2300	128.5
1	450	Whse.		2300	450
1	400	G.E.	TS-7565	2300	1200
1	400	G.E.	TS	2300	400

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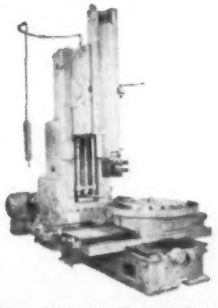

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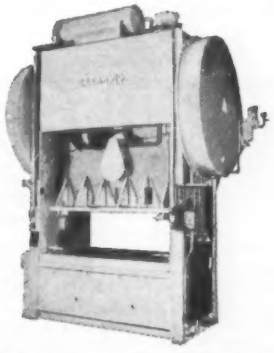

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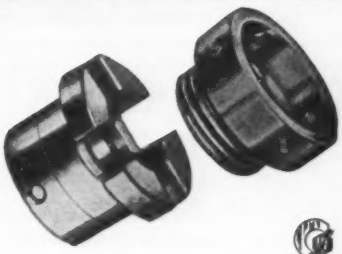

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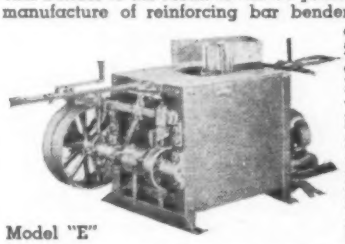

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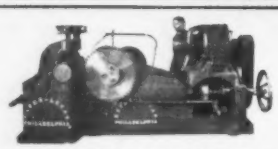
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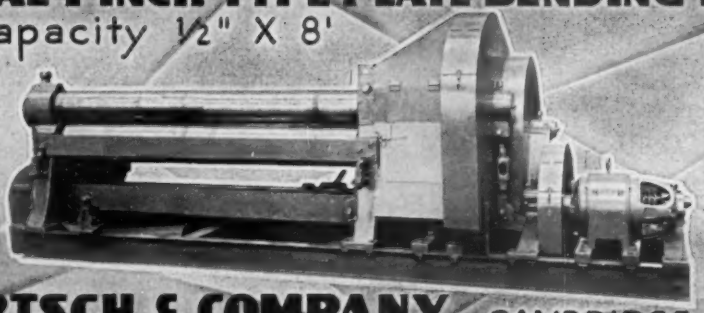

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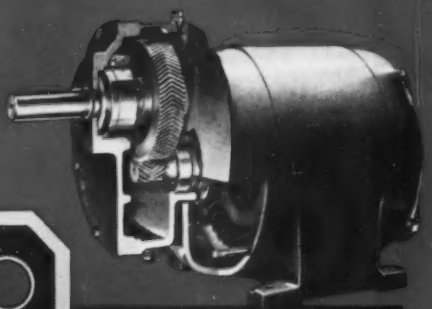
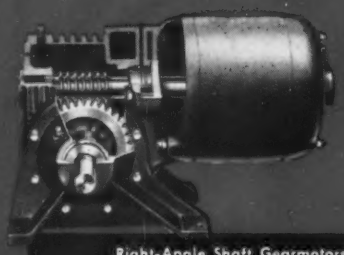

Parallel Shaft Gearmotors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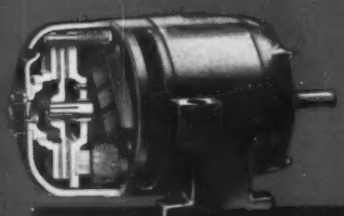
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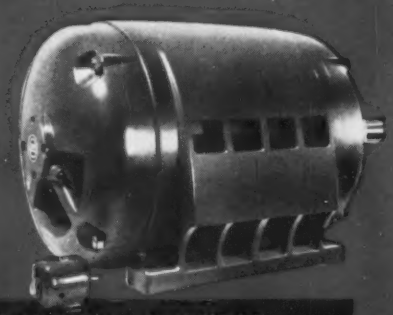
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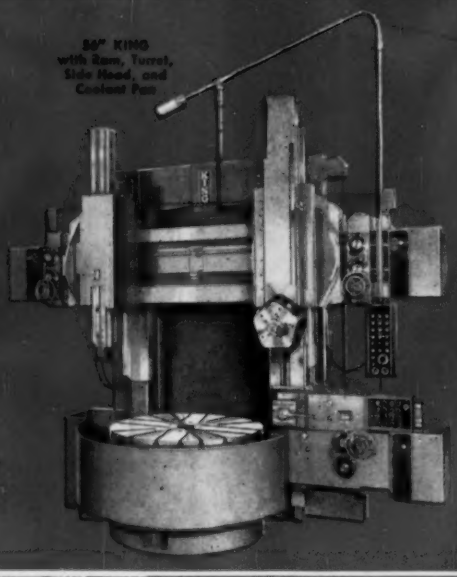
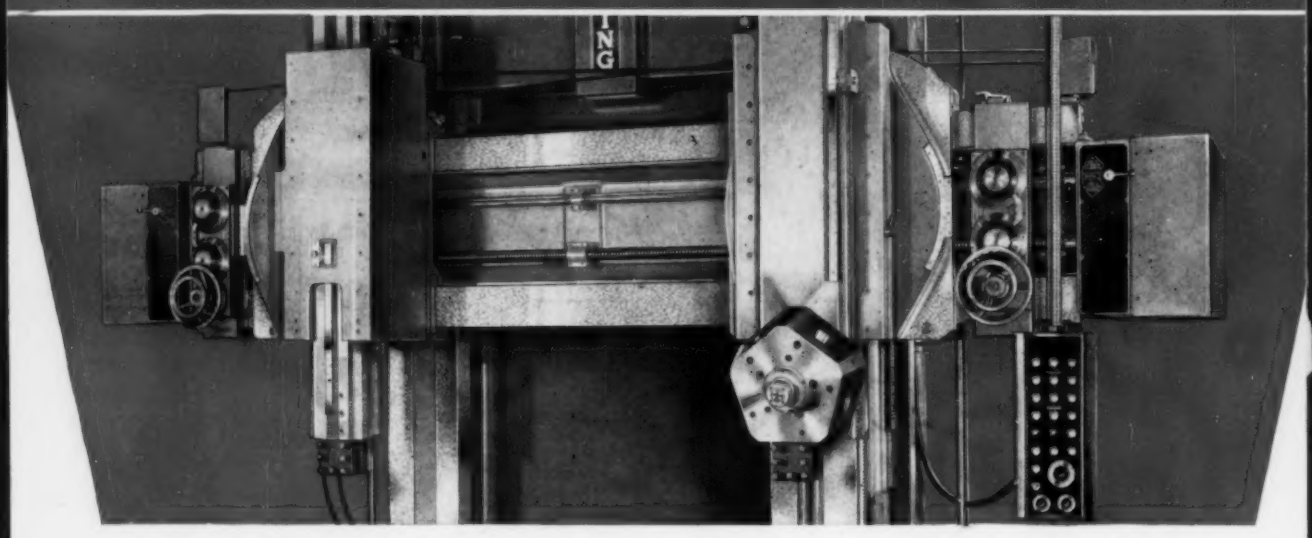
RAIL and RAIL HEAD CONSTRUCTION of the all new KING assures unvarying high accuracy





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